

GRE Manual v8.0 Drill Explanations

How to Use these Explanations

This document contains explanations for the drill questions found in GRE Manual v8.0. It does not contain explanations for the in class problems. Your teacher will supply the answers to the instructional problems during your classroom sessions. If the problem is featured in a section labeled as either drill or practice, you'll find the explanation in this document.

Most of the problems in the sections labeled as drill or practice will be done in class. At times, however, your teacher may assign some of those problems as additional homework. (*Consult your syllabus a full list of the homework that goes with each session of your class.*) Once you complete any problems or drills that your teacher assigned as additional homework, use this document to check your answers. If you got question wrong, these explanations should help you to understand your error. You can always ask your teacher about any problems that remain unclear even after you have worked through the explanation.

It is strongly suggested that you do work on drills for lessons that you have not already covered in class. In each class you will learn how to best approach each type of problem. If you attempt drills before you have covered the lesson in class, you lose the opportunity to practice those best approaches. Remember, as well, that most drills in the manual will be done during class. If you want to do additional practice, there is a large bank of online drills in your student portal.

If you have any questions, be sure to ask your teacher!

Special Thanks

Special thanks to Elissa Morel for writing these explanations!

Lesson 1 Math

Plugging In Drill (page 26)

1. E

Since there are variables in the answer choices, Plug In. Use an easy number for Heidi's age such as $h = 10$. Bill is twice as old as Heidi, so $b = 10 \times 2 = 20$. Since Bill is 6 years younger than Mel, $m = 20 + 6 = 26$. That is the target answer, so circle it. Now, check the answer choices. Choice (A) is $10 - 4 = 6$ which does not match the target, so eliminate it. Choice (B) is $10 + 4 = 14$. Eliminate it. Choice (C) is $20 - 4 = 16$. Eliminate it. Choice (D) is $2 \times 10 = 20$. Eliminate it. Choice (E) is $20 + 6 = 26$ which matches the target. The correct answer is (E).

2. D

This is a Quant Comp question with variables, so Plug In. First, Plug In an easy number such as $x = 2$. So Quantity A is $6 + 2 = 8$ and Quantity B is $6 - 2 = 4$. Since Quantity A is greater, eliminate answer choices (B) and (C). Now, Plug In again using FROZEN. Try $x = 0$. In this case, the two quantities are equal. Eliminate choice (C). The correct answer is (D).

3. D

This is a Quant Comp question with variables, so Plug In. Since the question restrictions are $0 < x < 10$ and $0 < y < 1$, Plug In easy numbers according to these restrictions such as $x = 5$ and $y = 0.5$. Quantity A is $5 - 0.5 = 4.5$. Since Quantity B is greater, eliminate answer choices (A) and (C). Now, Plug In again using FROZEN. Try Extreme values from the endpoints of the ranges such as $x = 9.9$ and $y = 0.1$. Now, Quantity A is $9.9 - 0.1 = 9.8$. Since Quantity A is greater, eliminate choice (B). The correct answer is (D).

4. B

Since there are variables in the answer choices, Plug In. Use an easy number for Mike's age such as $m = 10$. In four years, Mike will be $10 + 4 = 14$. Therefore, eleven years ago, Lauren was $14 \div 2 = 7$. Now, Lauren is $7 + 11 = 18$. That is the target answer, so circle it and check the answer choices. Choice (A) is $4(10) - 11 = 29$ which does not match the target, so eliminate it. Choice (B) is $\frac{1}{2}(10 + 4) + 11 = 18$ which matches the target. Keep choice (B) and check the remaining answers. Choice (C) is $\frac{1}{2}(10 - 11) = -\frac{1}{2}$. Eliminate it. Choice (D) is $4(10) + \frac{11}{2} = \frac{91}{2}$. Eliminate it. Choice (E) is $2(10) - 7 = 13$. Eliminate it. The correct answer is (B).

5. A

This is a Quant Comp question with variables, so Plug In. First, Plug In easy numbers such as $P = 2$ and $Q = 3$. In that case, Quantity A is $3 - 2 = 1$ and Quantity B is $\frac{1}{3}$. Since $\frac{1}{3} < 1$, eliminate choices (B) and (C). Now, Plug In again using FROZEN. Try $P = -1$ and $Q = 0$. Now, Quantity A is $0 - (-1) = 1$ and Quantity B is again $\frac{1}{3}$. Quantity A is still greater. Continue Plugging In until all the FROZEN options are exhausted. Regardless of which values are used, notice that Quantity B is *always* $\frac{1}{3}$ of Quantity A, so Quantity A is *always* greater. The correct answer is (A).

6. E

Since there are variables in the answer choices, Plug In. Use easy numbers for the consecutive odd integers such as 3, 5, and 7. The sum is $3 + 5 + 7 = 15 = k$. The greatest of the three integers is 7 which is the target answer, so circle it. Now, check the answer choices plugging in $k = 15$. Choice (A) is $\frac{15 - 6}{3} = 3$ which doesn't match the target. Eliminate it. Choice (B) is $\frac{15 - 3}{3} = 4$. Eliminate it. Choice (C) is $\frac{15}{3} = 5$. Eliminate it. Choice (D) is $\frac{15 + 3}{3} = 6$. Eliminate it. Choice (E) is $\frac{15 + 6}{3} = 7$ which matches the target. The correct answer is (E).

7. D

This is a Quant Comp question with variables, so Plug In. First, Plug In an easy number such as $G = 6$. Since F costs three times as much as G , item $F = 3 \times 6 = 18$. So Quantity A is 18. Since H is \$4 more than one-third G , item $H = 2 + 4 = 6$. So, Quantity B is 6. Since Quantity A is greater, eliminate answer choices (B) and (C). Now, Plug In again using FROZEN. Try $G = 1$. In that case, $F = 3$ and $H = 4 \frac{1}{3}$. Now, Quantity B is greater, so eliminate choice (A). The correct answer is (D).

Lesson 1

Sentence Equivalence Drill (page 39)

1. B and C

The blank refers to the palette. The clue is *stunning array of colors present in our natural world*. So a good word for the blank is “abundant.” Choice (A), *fixed*, does not match “abundant.” Eliminate it. Choice (B), *infinite*, and choice (C), *inexhaustible*, are both good matches for “abundant.” Keep these choices. Choice (D), *realistic*, is not a good match for “abundant.” Eliminate it. Choice (E), *limited*, is opposite in meaning of the word for the blank, so eliminate it. Choice (F), *essential*, is not a good match. Eliminate it. The correct answer is (B) and (C).

2. B and E

The blank refers to James’s work associates. The clue is *trusted his financial savvy and testified on his behalf*. So a good word for the blank is “faithful.” Choice (A), *cynical*, does not match “faithful.” Eliminate it. Choice (B), *unwavering*, is a good match for “faithful.” Keep this choice. Choice (C), *petty*, and choice (D), *recent*, are not good matches for “faithful.” Eliminate these choices. Choice (E), *steadfast*, which means unwavering, is also a good match for “faithful.” Keep this choice. Choice (F), *capricious*, which means unpredictable, is not a good match. Eliminate it. Therefore, the correct answer is (B) and (E).

3. C and E

The blank refers to young adults. The clue is *their parents who remained at one employer for life*. The contrasting transition word, *unlike*, indicates that the word for the blank is opposite in meaning of the clue. So a good word for the blank is “transitory.” Choice (A), *stingy*, and choice (B), *cunning*, do not match “transitory.” Eliminate these choices. Choice (C), *itinerant*, which means traveling from place to place, is a good match. Keep this choice. Choice (D), *famous*, is not a good match. Eliminate it. Choice (E), *peripatetic*, which means traveling about, is also a good match. Keep this choice. Choice (F), *unmanageable*, is not a good match. Eliminate it. The correct answer is (C) and (E).

4. D and E

The blank refers to a type of traveler. The clue is *can resist the rustic charms*. The contrasting transition *not even* indicates that normally this type of traveler can resist the rustic charms, so a good word for the blank is “hardened.” Choice (A), *dogged*, which means persistent, is not a good match for “hardened.” Eliminate it. Choice (B), *crafty*, which means cunning, is not a good match. Eliminate it. Choice (C), *unstinting*, which means frugal, is not a good match. Eliminate it. Choice (D), *disgruntled*, which means dissatisfied, is a good match. Keep this choice. Choice (E), *jaded*, which means worn out by overuse, is also a good match. Keep this choice. Choice (F), *benevolent*, which means charitable and kind, is not a good match. Eliminate it. The correct answers are (D) and (E).

5. A and B

The blank refers to the studio head. The clue is *lets his underlings speak for him during most meetings, remaining silent until absolutely necessary*. So “silent” is a good word for the blank. Choice (A), *taciturn* and choice (B), *laconic*, both mean reserved or using few words, so keep these two choices. Choice (C), *solicitous*, which means concerned, is not a good match. Eliminate it. Choice (D), *impertinent*, which means rude, is not a good match. Eliminate it. Choice (E), *loquacious*, which means talkative, is opposite in meaning of the clue. Eliminate it. Choice (F), *blithe*, which means casual and cheerful indifference, is not a good match. Eliminate it. The correct answer is (A) and (B).

Text Completion Drill (page 43)

1. B

The blank refers to cities. The clue is *affordable transportation option*. So a good word for the blank is “thrifty.” Choice (A), *sprawling*, is not a good match for “thrifty.” Eliminate it. Choice (B), *impoverished*, is a good match for “thrifty” since cities that are impoverished are concerned about costs. Keep this choice. Choice (C), *resilient*, is not a good match. Eliminate it. Choice (D), *provincial*, which means local, is not a good match. Eliminate it. Choice (E), *ambitious*, is not a good match. Eliminate it. The correct answer is (B).

2. B

The blank refers to the desire to see mysteries solved. The clue is *enduring popularity*. So a good word for the blank is “enduring.” Choice (A), *ephemeral*, which means fleeting, is opposite in meaning of the word for the blank. Eliminate it. Choice (B), *perennial*, is a good match for “enduring.” Keep this choice. Choice (C), *nascent*, which means starting to grow or develop, is not a good match. Eliminate it. Choice (D), *hackneyed*, which means commonplace or trite, is not a good match. Eliminate it. Choice (E), *intermittent*, which means sporadic, is not a good match. Eliminate it. The correct answer is (B).

3. D

The blank refers to information. The clue is *limited familiarity*. So a good word for the blank is “lack.” Choice (A), *bounty*, is opposite in meaning of the word for the blank. Eliminate it. Choice (B), *succor*, which means relief or aid, is not a good match. Eliminate it. Choice (C), *overabundance*, is also opposite in meaning of “lack.” Eliminate it. Choice (E), *rubric*, is not a good match. Eliminate it. The correct answer is (D).

Lesson 2 Math

Exponents & Roots Drill (page 50)

1. E

If $3^n = 729$, then $n = 6$. Now, Plug In 6 for n in the equation which results in $(3^5)(x^4) = 3(18^4)$. Next, factor 18^4 . Since $18^4 = 9^4 \times 2^4 = 3^8 \times 2^4$, the original equation can be rewritten as $(3^5)(x^4) = 3(3^8 \times 2^4)$ which simplifies to $(3^5)(x^4) = 3^9 \times 2^4$. Now, use the Divide-Subtract exponent rule and divide each side of the equation by 3^5 which results in $x^4 = 3^4 \times 2^4$. So $x = 3 \times 2 = 6$. Therefore, the value of $n + x$ is $6 + 6 = 12$. The correct answer is (D).

2. E

Since the question involves exponents, use the MADSPM rules. The Divide-Subtract exponent rule applies. So $\frac{3^{2x+2y}}{3^{2x-2y}} = 3^{2x+2y-(2x-2y)} = 3^{4y}$. Since $3^4 = 81$, $3^{4y} = 81^y$. The correct answer is (E). Alternately, since there are variables in the answer choices, Plug In. To avoid using numbers already in the question, Plug In $x = 5$ and $y = 4$. In that case, $\frac{3^{2x+2y}}{3^{2x-2y}} = \frac{3^{10+8}}{3^{10-8}} = \frac{3^{18}}{3^2}$. Use the Divide-Subtract exponent rule to determine that $\frac{3^{18}}{3^2} = 3^{16}$. That is the target answer, so circle it. Now, check the answer choices. Since the answer choices are not in the same base as the target answer, rewrite 81 using the common base of 3. So, $81 = 3^4$. Choice (A) is $(3^4)^{-5} = 3^{-20}$ which does not match the target, so eliminate it. Choice (B) is $(3^4)^{-4} = 3^{-16}$. Eliminate it. Choice (C) is 1. Eliminate it. Choice (D) is $(3^4)^5 = 3^{20}$. Eliminate it. Choice (E) is $(3^4)^4 = 3^{16}$ which matches the target. The correct answer is (E).

3. C

Since there are no variables in this Quant Comp question, eliminate choice (D). Notice that $\sqrt[3]{128}$ is not in its simplest form, so use the rule for multiplying roots, $\sqrt{ab} = \sqrt{a} \times \sqrt{b}$ to factor 128 into the product of a cube root and another integer. So $\sqrt[3]{128} = \sqrt[3]{64} \times \sqrt[3]{2} = 4\sqrt[3]{2}$ and Quantity A is $4\sqrt[3]{2}$. Now, work with Quantity B. Since the values under the radical sign in Quantity B are not the same, they can't be subtracted. Look for a way to simplify the root. $\sqrt[3]{250}$ is already in its simplest form, so work with $\sqrt[3]{250}$. Use the rule for multiplying roots to factor 250 into the product of a cube root and another integer. So $\sqrt[3]{250} = \sqrt[3]{125} \times \sqrt[3]{2} = 5\sqrt[3]{2}$. Now that the numbers under the radical sign are the same, subtract. The result is $5\sqrt[3]{2} - 3\sqrt[3]{2} = 2\sqrt[3]{2}$. Since Quantity B is also $4\sqrt[3]{2}$, the two quantities are equal and the correct answer is (C).

Plugging In Drill (page 58)

1. A

This is a Quant Comp Plugging In question. Plug In an easy number for the total members of the team such as 6. If one-half the members of the team are juniors, then the number of juniors is 3. So, Quantity A is 3. If one-third of the members are sophomores, then there are 2 sophomores. If the remainder are seniors, then the numbers of seniors is $6 - (3 + 2) = 1$. So, Quantity B is 1. Since Quantity A is greater, eliminate choices (B) and (C). Now, Plug In again using FROZEN. Try an Extreme number for the total members of the team such as 120. Now, the number of juniors is one-half of 120 which is 60. So, Quantity A is 60. The number of sophomores is one-third of 120 which is 40. The number of seniors is $120 - (60 + 40) = 20$. So, Quantity B is 20. Again, Quantity A is greater. None of the other FROZEN options are applicable (the total members of the team cannot be a fraction, zero, one or a negative number and there are no repeats in the question). Therefore, the correct answer is (A).

2. C

Since there are variables in the answer choices, Plug In. The question restriction is $-1 < x < 0$, so Plug In a number according to the restriction such as $x = -\frac{1}{2}$. Now, use that value for x in the answer choices to find the answer with the greatest value. Choice (A) is

$$-\frac{1}{2}. \text{ Choice (B) is } \left(-\frac{1}{2}\right)^3 = -\frac{1}{8}. \text{ Choice (C) is } -\left(\frac{1}{-\frac{1}{2}}\right) = 2. \text{ Choice (D) is } \frac{1}{-\frac{1}{2}} = -2.$$

Choice (E) is $1 + \left(-\frac{1}{2}\right) = \frac{1}{2}$. Choice (C) has the greatest value and is the correct answer.

3. C

Since there are exponents, rewrite the equation using common bases. $(3^{2x})\left(\frac{1}{9}\right) = 3^n$

can be rewritten as $(3^{2x})\left(\frac{1}{3^2}\right) = 3^n$. Now simplify: $\frac{3^{2x}}{3^2} = 3^n$. Next, use the Divide-

Subtract exponent rule. So, $3^{2x-2} = 3^n$ or $2x - 2 = n$ which is choice (C).

Alternately, since there are variables in the answer choices, Plug In. Use an easy number such as $x = 2$. The equation is then $(3^4)\left(\frac{1}{9}\right) = \frac{81}{9} = 9 = 3^2$. Therefore, $n = 2$. That is the

target answer, so circle it. Now, check the answer choices. Choice (A) is $2(2) = 4$ which does not match the target, so eliminate it. Choice (B) is $2(2) + 2 = 6$. Eliminate it. Choice (C) is $2(2) - 2 = 2$ which matches the target, so keep choice (C) and continue checking the remaining choices. Choice (D) is $2(2) - 3 = 1$. Eliminate it. Choice (E) is $2(2) - 9 = -5$. Eliminate it. The correct answer is (C).

4. B

Since there are actual numbers in the answer choices, Plug In the Answers (PITA). The answers represent the first term in the sequence, so label the column of answers: 1st. Start with answer choice (C) which is 1. The question states that every term after the first is one less than three times the previous term. $(1 \times 3) - 1 = 2$, so 2 is the second term in the sequence. Label the next column: 2nd. The third term is $(2 \times 3) - 1 = 5$, so label the next column: 3rd. The fourth term is $(5 \times 3) - 1 = 14$, so label the next column: 4th. The fifth term is $(14 \times 3) - 1 = 41$, so label the next column: 5th. The question states that the 5th term – the 3rd term = 28. Using answer choice (C), $5^{\text{th}} - 3^{\text{rd}} = 41 - 5 = 36$ which is greater than 28, so eliminate answer choice (C) as well as choices (D) and (E).

Now, try a lesser 1st term value such as $\frac{8}{9}$ in answer choice (B). Now, the 2nd term is

$\left(\frac{8}{9} \times 3\right) - 1 = \frac{24}{9} - 1 = \frac{15}{9} = \frac{5}{3}$. The 3rd term is $\left(\frac{5}{3} \times 3\right) - 1 = 5 - 1 = 4$. The 4th term is $(4 \times 3) - 1 = 11$. The 5th term is $(11 \times 3) - 1 = 32$. Now, $5^{\text{th}} - 3^{\text{rd}} = 32 - 4 = 28$. Therefore, the correct answer is (B).

5. D

Since there is an unknown value (the number of trees), and the answer choices are expressed as fractions, this is a Hidden Plug In. The question stem mentions percents, so Plug In 100 for the number of trees. If 20% of the trees are evergreens, then there are 20 evergreens and 80 non-evergreens. If 40% of the non-evergreens are maples, then there are $(0.4)(80) = 32$ maple trees. If there are 75% as many oak trees as maple trees, then there are $(0.75)(32) = 24$ oak trees. The number of trees that are *not* maples, oaks, or evergreens is $100 - (32 + 24 + 20) = 100 - 76 = 24$. Therefore, the fraction of trees that are *not* maples, oaks, or evergreens is $\frac{24}{100} = \frac{6}{25}$. The correct answer is (D).

6. C

Since there are variables in the answer choices, Plug In. There are 3 variables in the question. Since the dollar value (z) that Colby has determines the dollars that Mike and Pat have, Plug In an easy number for z such as $z = 15$. Now, Plug In a value for x such as $x = 10$. If Colby (z) has x dollars more than Mike has, then Mike has $15 - 10 = 5$ dollars. Now, Plug In a value for y such as $y = 6$. If Colby has y dollars less than Pat has, then Pat has $15 + 6 = 21$ dollars. Therefore, the number of dollars that Mike and Pat have altogether is $5 + 21 = 26$. That is the target answer, so circle it. Now, check the answer choices. Choice (A) is $15 - 6 - 10 = -1$ which does not match the target, so eliminate it. Choice (B) is $15 + 6 - 10 = 11$. Eliminate it. Choice (C) is $2(15) + 6 - 10 = 26$ which matches the target, so keep choice (C) and continue checking the remaining answer choices. Choice (D) is $2(15) - 6 + 10 = 34$. Eliminate it. Choice (E) is $2(15) - 6 - 10 = 14$. Eliminate it. The correct answer is (C).

Lesson 2 Verbal

Arguments Drill (page 80)

1. C

This is an assumption question as evidenced by the phrase, *which of the following assumptions*. Begin by working the argument. The conclusion of the argument is *if Intercontinental Airlines wants to attract more customers, it should offer a gift to each passenger*. The premise is *Computer Resources has been setting new sales records by including complimentary software with every purchase of its latest computer model*. The argument involves an analogy pattern which assumes that Intercontinental Airlines' customers are similar to Computer Resources' customers. The credited response will connect the premise and conclusion. Choice (A) is out of scope since the argument does not address *train travelers*. Eliminate it. Choice (B) is out of scope since the argument does not address *safety records*. Eliminate it. Choice (C) connects the premise and conclusion by linking computer buyers and complimentary offers with airline ticket buyers and complimentary offers. Keep this choice. Choice (D) does not connect the premise and conclusion. In fact, it demonstrates that airplane ticket purchasers are *not similar* to computer purchasers. Eliminate it. While choice (E) does mention that airplane ticket purchasers are *similar* to computer purchasers, it is out of scope since the argument does not address *discretionary income*. Eliminate it. The correct answer is choice (D).

2. A

This is an assumption question as evidenced by the phrase, *the argument assumes which of the following*. Begin by working the argument. The conclusion of the argument is *ghrelin is at least partly responsible for overeating*. The premise is *a recent study revealed that participants who overate also produced high concentrations of the hormone ghrelin while patients who did not overeat had normal or low concentrations of this hormone*. The argument involves a causal pattern which assumes that there are no other factors and it's not a coincidence. The credited response will connect the premise and conclusion. Choice (A) states that it is not the reverse – overeating does not cause the production of ghrelin. This is an assumption of the argument that connects the conclusion and the premise. So keep this choice. Choice (B) uses the extreme language *no other*. The argument concludes that ghrelin is *at least partly responsible*, so the argument does not assume that *no other hormone affects overeating*. Eliminate this choice. Choice (C) also uses the extreme language *no other* and is incorrect for the same reasons as choice (B). Eliminate it. Choice (D) is out of scope since the argument does not address *willpower*. Eliminate it. Choice (E) uses the extreme language *will never overeat*. Eliminate it. The correct answer is choice (A).

3. C

This is a weaken question as evidenced by the phrase, *most seriously weakens the argument*. Begin by working the argument. The conclusion of the argument is that *the park's Director has put forth a proposal to charge visitors to the park a fee based on the number of hours spent in the park*. The premise is that *the fee will induce tourists to limit their time in the park and thus protect the fragile desert environment*. The assumption is that there is no problem with the plan to charge a fee. The credited response will attack the assumption. Choice (A) is out of scope because the argument does not address *shorter trails*. Eliminate it. Choice (B) somewhat weakens the argument because the fee will not have the intended effect. However, it only applies to *most tourists*. Eliminate it. Choice (C) definitely weakens the argument because it demonstrates that the fee can be completely circumvented by entering the park early and leaving late. This choice clearly shows that there is a problem with the plan. Keep this choice. Choice (D) is out of scope because the argument does not address *an important issue for most visitors*. Eliminate it. Choice (E) is also out of scope because the argument does not address *Chasmlands National Park*. Eliminate it. The correct answer is choice (C).

4. D

This is a weaken question as evidenced by the phrase, *cast the most doubt*. Begin by working the argument. The conclusion of the argument is that *excessive government regulation, not the current high price of oil, is responsible for the poor industrial production in Country A since its new government came to power*. The premise is that *Country B pays the same price for oil, but while industrial output in Country A has been falling, it has been rising in Country B*. The argument involves an analogy pattern which assumes that Country A is similar to Country B. The credited response will indicate that two countries are not similar and cannot be compared. Choice (A) is out of scope because the argument does not address *agricultural production*. Eliminate it. Choice (B) is out of scope because the argument is concerned with industrial production not the import/export of *minerals*. Eliminate it. Choice (C) *strengthens* the argument because it demonstrates that the two countries *are similar*. Eliminate it. Choice (D) demonstrates that the two countries are *not similar* because the industrial goods produced in each country are different. That weakens the argument. Keep this choice. Choice (E) is out of scope because the argument does not address a *cleaner environment*. Eliminate it. The correct answer is choice (D).

5. E

This is an inference question as evidenced by the phrase, *which of the following can be concluded*. The facts of the argument are that anxiety and external pressure lead to nausea. *All* the auditioners suffer from external pressure. *Some* of the auditioners feel anxiety. The producers select *only* those contestants who feel *anxiety*. The credited response will make a statement that must be true based on these facts. Choice (A) is out of scope because the argument does not pertain to *other shows*. Eliminate it. Choice (B) is not supported by the facts of the argument. There is no indication that *most* of the auditioners become contestants. Eliminate it. Choice (C) is out of scope because the argument does not pertain to the nausea of the *producers*. Eliminate it. Choice (D) uses the extreme language *no auditioner* and it is not supported by the facts of the argument. The argument provides *one way* in which auditioners feel nausea. It's not necessarily the *only* way. An auditioner could feel nausea from a bad lunch. Eliminate this choice. Choice (E) must be true based on the facts of the argument. If *all* the auditioners suffer from external pressure, the producers select *only* those contestants who feel anxiety, and a combination of anxiety and external pressure leads to nausea, then *all* of the auditioners who become contestants have nausea. The correct answer is (E).

Lesson 3 Math

Averages, Medians & Modes Drill (page 94)

1. B,C,D

Use an Average Pie to determine the average for each scenario. The vet could see 1 dog and 1 cat. The *Total* is $65 + 45 = 110$ and the *# of things* is 2, so the *Average* is $110 \div 2 = 55$. Select choice (B). The vet could see 2 dogs and 1 cat. Then the total is $65 + 65 + 45 = 175$ and the average is $175 \div 3 = 58.33$. Select choice (C). The vet could see 3 dogs and 1 cat. Then the total is $65 + 65 + 65 + 45 = 240$ and the average is $240 \div 4 = 60$. Select choice (D). The vet could see 4 dogs, but since there are fewer than 4 dogs seen for every cat seen, he would have to see 2 cats. Then the total is $65 + 65 + 65 + 65 + 45 + 45 = 350$ and the average is $350 \div 6 = 58.33$ which was already selected. The vet could see 5 dogs and 2 cats. Then the total is $65 + 65 + 65 + 65 + 65 + 45 + 45 = 415$ and the average is $415 \div 7 = 59.23$ which is not an option. Any other scenario results in one of the choices already selected or an average charge that is not an answer choice. The correct answer is (B), (C), (D).

2. C

Plug In 5 consecutive positive integers such as 2, 3, 4, 5, and 6 for set *X*. The sum is 20 which is Quantity A. Since the median, the number in the middle, is 4, and $5 \times 4 = 20$, Quantity B is also 20. The two quantities are equal, so eliminate answer choices A and B. Now, Plug In again using FROZEN. The question restriction limits the options to consecutive positive integers, so try Extreme numbers such as 100, 200, 300, 400 and 500. The sum of Set *X* is now 1,500 which is Quantity A. The median is 300, so Quantity B is $5 \times 300 = 1,500$. The two quantities are again equal. Regardless of which numbers are used for set *X*, the two quantities are always equal because the set of numbers is evenly spaced, so the average and the median are equal (since the numbers contribute the same weight to the average, the average is the middle number). Thinking about an Average Pie, Quantity A is the *Total* and Quantity B is the *# of things* \times the *Average* (in this case, the median) which equals the *Total*. The correct answer is (C).

3. 1.4

First, use an Average Pie to determine the *Total* for each group. For Group A, the *# of things* is 40 and the *Average* is 0.6, so the *Total* is $40 \times 0.6 = 24$. For Group B, the *Total* is $35 \times 1.3 = 45.5$. For Group C, the *Total* is $30 \times 2.2 = 66$. For Group D, the *Total* is $20 \times 1.8 = 36$. Now, use an Average Pie to determine the average data coverage for the 125 people in the four groups combined. Since the *Total* is $24 + 45.5 + 66 + 36 = 171.5$ and the *# of things* is 125, the average is $171.5 \div 125 = 1.372$. The question asks for the answer to the nearest 0.1 which is 1.4.

Drill (page 100)

1. B

Since this is a question about *work*, use a Rate Pie to determine the rates for Joan and Ken. The number of units for the entire job (*Work*) is not provided, so Plug In a multiple of 12, 6, and 3 such as 24 units. Draw a Rate Pie for Joan. If Joan can do an entire job in 12 hours, then Joan's rate is $24 \div 12 = 2$ units per hour. Next, draw a Rate Pie for Ken. If Ken can do an entire job in 6 hours, then Ken's rate is $24 \div 6 = 4$ units per hour. Now, draw a Rate Pie for Joan and Ken working together. If Joan and Ken work together for 3 hours and their combined rate is $2 + 4 = 6$ units per hour, then together they complete $3 \times 6 = 18$ units. The remainder of the job is then $24 - 18 = 6$ units. Draw a Rate Pie for Ken to finish the rest of the job by himself. The number of units remaining is 6 and his rate is 4 units per hour, so the time that it will take Ken to finish the job is $6 \div 4 = \frac{6}{4} = 1\frac{1}{2}$ hours. The correct answer is (B).

2. C

Since this question is about a *ratio*, draw a ratio box. The columns are workers who take the **Bus**, workers who **Drive** and the **Total**. The ratio of workers who take the bus to those who drive is 2 : 5, so that total is $2 + 5 = 7$. Fill in those numbers in the ratio row. The actual number of workers who drive to work is 120, so fill in that number in the Actual number row of the Drive column. Since $120 \div 5 = 24$, the multiplier is 24. Therefore, the actual number of workers at the factory is $7 \times 24 = 168$. The correct answer is (C). The completed ratio box looks like this:

| | Bus | Drive | Total |
|----------------------|------------|--------------|--------------|
| Ratio | 2 | 5 | 7 |
| Multiplier | 24 | 24 | 24 |
| Actual Number | 48 | 120 | 168 |

3. C

Since there are actual numbers in the answer choices and the question asks *how much*, Plug In The Answers (PITA). The answer choices represent the total interest that Erik paid on the two loans, so label them as such. Start with answer choice (C). If the total interest is \$288, and the interest paid on each loan is the same amount, then the interest per loan is $288 \div 2 = 144$. If the simple annual interest rate is 4% for the first loan, then the loan amount at 4% is $144 = \frac{4}{100}x$ and $x = 3,600$. If the simple annual interest rate on the second loan is 6%, then the loan amount at 6% is $144 = \frac{6}{100}x$ and $x = 2,400$. The sum of the two loans is then $3,600 + 2,400 = 6,000$ which matches the amount that Erik borrowed. The correct answer is (C).

4. B

At first glance, this question seems to involve Plugging In. However, it's difficult to find numbers to Plug In and drawing an Average Pie doesn't seem to help. Upon closer inspection, it is clear that it is a weighted average question. If club *K* and club *Q* have an equal number of members, then the average age of the members of both clubs combined is $\frac{22+29}{2} = 25.5$ years. Since the average age of the members of both clubs combined is actually 27 years, which is closer to 29, club *Q* has more members. The correct answer is (B).

5. E

Since there are actual numbers in the answer choices, Plug In the Answers (PITA). The answers represent Dan's actual average speed when he drives from his job to the restaurant, so label them as such. Start with answer choice (C), 45. To determine the time that it takes him to drive from his job to the restaurant, use a Rate pie. Since the distance is not provided, Plug In a convenient value for the distance to evaluate each answer choice. If the distance is 90 miles, then the time is $\frac{90}{45} = 2$ hours. If his speed is increased by 20 miles per hour, then his new speed is $45 + 20 = 65$ miles per hour. The time that it takes him is then $\frac{90}{65} = 1.38$ hours. Use the percent change formula:

$$\frac{\text{difference}}{\text{original}} \times 100 \text{ to determine the reduction in time. } \frac{2 - 1.38}{2} \times 100 = 31\% \text{ which is}$$

greater than the 25% stated in the question. So, eliminate choice (C). Since a greater starting number is needed, also eliminate choices (A) and (B) and try choice (D) next. If Dan's actual speed is 50 miles per hour, Plug In a convenient distance such as 100 miles.

The time is then $\frac{100}{50} = 2$ hours. If his speed is increased by 20 miles per hour, then his

new speed is $50 + 20 = 70$ miles per hour. The time that it takes him is then $\frac{100}{70} = 1.43$

hours. That's a reduction of $\frac{2 - 1.43}{2} \times 100 = 28.5\%$ which is still greater than the 25%

stated in the question. So, eliminate choice (D) and try choice (E) next. If Dan's actual speed is 60 miles per hour, Plug In a convenient distance such as 120 miles. The time is then $\frac{120}{60} = 2$ hours. If his speed is increased by 20 miles per hour, then his new speed is

$60 + 20 = 80$ miles per hour. The time that it takes him is then $\frac{120}{80} = 1.5$ hours. That's a

reduction of $\frac{2 - 1.5}{2} \times 100 = 25\%$ which matches the value in the question. The correct answer is (E).

6. B

Since there are actual numbers in the answer choices, Plug In the Answers (PITA). The answers represent the average depth of the pond in August, so label them as such. Start with answer choice (C), 25 inches. If each vertical axis represents one inch, then the average depth decreased 5 inches from July to August. So the average depth of the pond in July was $25 + 5 = 30$ inches. Use the percent change formula: $\frac{\text{difference}}{\text{original}} \times 100$ to

determine the percentage decrease from July to August. $\frac{30 - 25}{30} \times 100 = 16.67\%$ which

is less than the 20% decrease stated in the question. So eliminate choice (C). Since a lesser starting number is needed, also eliminate choices (D) and (E) and try choice (B) next. If the average depth of the pond in August is 20 inches, then it is 25 inches in July.

The average depth decreased by $\frac{25 - 20}{25} \times 100 = 20\%$ which matches the value in the question. The correct answer is (B).

7. C

Since the question mentions, *average*, draw an Average Pie. The *# of things* is 40 and the *Average* is 10.3, so the *Total* is $40 \times 10.3 = 412$. Since “2” successful putts for one golfer was incorrectly recorded as “20”, the total is 18 points greater than it should be. So the actual *Total* is $412 - 18 = 394$. Now draw another Average Pie to determine the actual average. The *Total* is 394 and the *# of things* is still 40, so the actual average number of successful putts per golfer is $394 \div 40 = 9.85$. Since the two quantities are equal, the correct answer is (C).

8. D

Since there are variables in the answer choices, Plug In. Use easy numbers for x (the number of almonds) and y (the number of cashews) such as $x = 2$ and $y = 3$. Since the question is about a *ratio*, draw a ratio box. The columns are **Almonds**, **Cashews**, and the **Total**. The ratio of almonds to cashews is $2 : 3$, so that total is $2 + 3 = 5$. Fill in those numbers in the ratio row. The actual number of total nuts in the can is z . So Plug In a value for z that is a multiple of 5 such as $z = 15$. Since $15 \div 5 = 3$, the multiplier is 3. Therefore, the actual number of almonds in the can is $2 \times 3 = 6$. The completed ratio box looks like this:

| | Almonds | Cashews | Total |
|----------------------|----------------|----------------|--------------|
| Ratio | 2 | 3 | 5 |
| Multiplier | 3 | 3 | 3 |
| Actual Number | 6 | 9 | 15 |

Since 6 is the target answer, circle it. Now, check the answer choices. Choice (A) is $2 + 3 = 5$ which does not match the target, so eliminate it. Choice (B) is $15(2 + 3) = 15(5) = 75$.

Eliminate it. Choice (C) is $\frac{15}{2+3} = \frac{15}{5} = 3$. Eliminate it. Choice (D) is $\frac{2 \times 15}{2+3} = \frac{30}{5} = 6$

which matches the target, so keep choice (D). Choice (E) is $\frac{3 \times 15}{2+3} = \frac{45}{5} = 9$ which does not match the target. Eliminate it. The correct answer is (D).

9. C

Since there are variables in the answer choices, Plug In. Use easy numbers such as $x = 2$ and $y = 4$. Draw an Average Pie to determine that $z = \frac{4+2}{2} = 3$. The question asks for the value of y which is 4. That is the target answer, so circle it. Now, check the answer choices. Choice (A) is $\frac{2+3}{2} = \frac{5}{2}$ which does not match the target, so eliminate it. Choice (B) is $\frac{2+3}{3} = \frac{5}{3}$. Eliminate it. Choice (C) is $2(3) - 2 = 6 - 2 = 4$ which matches the target. So keep choice (C) and check the remaining answers. Choice (D) is $\frac{3}{3} - \frac{2}{2} = 1 - 1 = 0$. Eliminate it. Choice (E) is $3(3) - 2(2) = 9 - 4 = 5$. Eliminate it. The correct answer is (C).

10. A

Use an Average Pie to determine the *Total* for Zones One, Two and Three. Since the *# of things* is 3 and the *Average* is 8, the *Total* is $3 \times 8 = 24$. Therefore $x = 24 - (8.7 + 5.3) = 10$. Now, use another Average Pie to determine the *Total* for Zones Four and Five. Since the *# of things* is 2 and the *Average* is 5.5, the *Total* is $2 \times 5.5 = 11$. Therefore, $y = 11 - 5.7 = 5.3$. Since both Zone Three and Zone Five are 5.3, the mode, the number that occurs most frequently, is 5.3. Next, use a third Average Pie to determine the average of the five annual earthquake frequencies. Since the *Total* is $24 + 11 = 35$ and the *# of things* is 5, the *Average* is $35 \div 5 = 7$. Therefore, the difference between the average of the five annual earthquake frequencies and the mode of the five annual earthquake frequencies is $7 - 5.3 = 1.7$. The correct is (A).

Lesson 3 Verbal

Reading Comprehension Practice (page 120)

1. B

The subject of the question is the passage as a whole. The task is indicated by the phrase *the passage is primarily concerned with*. To answer the question, analyze the passage and determine why the author wrote it. The first paragraph claims that *strikes by industrial workers became increasingly common during the 1880s, a time when the American labor movement was in its infancy*. The first paragraph ends by mentioning the *rising inequality* between strikers and the *powerful capitalists*. The entire second paragraph is a discussion of the Haymarket Riot and its ultimate effect on labor. In the last sentence of the passage, the author claims that *a growing group of historians have correctly pointed to the popular identification of the executed defendants as martyrs as the spark which, rather than slowing the labor movement, actually carried it forward into the next century*. So, the passage is primarily concerned with describing the Haymarket Riot and its ultimate effect on labor. Choice (A) *relative merits of two points of view* does not match the purpose. Although there are two points of view, strikers and capitalists, the passage does not discuss the *relative merits* of each. Eliminate it. Choice (B) is a paraphrase of the information presented in the passage. Keep this choice. Choice (C) is a reversal. It did not lead to *the end of a historical trend*. The author states that it actually *carried it forward*. Eliminate it. Choice (D) contains the recycled language *reconciling* and *capitalists*. It is a reversal. The protests did not *reconcile* the differences. As the author concludes, it *actually carried* the labor movement *forward into the next century*. Eliminate it. Choice (E) does not match the purpose of the passage. The *difficulty that immigrants experienced* is too narrow a focus. Although the rally was organized by German *immigrant* labor leaders, the primary purpose is not the difficulties they faced. Eliminate it. The correct answer is (B).

2. D

The subject of the passage is *rising inequality*. The task is indicated by the phrase *it can be inferred that the author ... mentions “rising inequality” ...primarily to suggest*. To answer the question, determine what the passage states about the subject and then evaluate the answer choices to determine which is supported by the text. The third sentence claims that *anybody who wished to reconcile the two sides found themselves in the unenviable position of defending the positions taken by the powerful capitalists, including explaining rising inequality*. So, the author mentions *rising inequality* to suggest that it was difficult to defend the increasing disparity in wealth between the *powerful capitalists* and the strikers. Choice (A) uses the comparison words *more in touch with*. Although the passage mentions labor leaders and Carnegie/Rockefeller, there is no such comparison between the two regarding *essential issues of the day*. Eliminate it. Choice (B) uses the extreme language *hopelessly out of touch* which is not supported by the passage and that is not what the passage suggests about “*rising inequality*.” Eliminate it. Choice (C) uses the extreme language *the only way* which is not supported by the passage and that is not what the passage suggests about “*rising inequality*.” Eliminate it. Choice (D) is supported by the passage. *Difficult for anyone to justify* matches *unenviable position of defending* in the passage and *national discrepancy in income* relates to *rising inequality*. Keep this choice. Choice (E) uses the comparison words *more likely to press*. There is no such comparison regarding the likeliness of strikers pressing for higher wages in the passage. Eliminate it. The correct answer is (D).

3. E

The subject of the passage is *organizers of the Haymarket protest*. The task is indicated by the phrase *it can be inferred that the author of the passage would most likely agree with which of the following claims*. To answer the question, determine what the passage states about the subject and then evaluate the answer choices to determine which is supported by the text. The last sentence of the passage claims that *although evidence of these negative effects can clearly be identified in the historical record, a growing group of historians have correctly pointed to the popular identification of the executed defendants as martyrs as the spark which, rather than slowing the labor movement, actually carried it forward into the next century*. So, the author thinks that it ultimately had a positive effect for the labor movement. Choice (A) uses the extreme wording *they were justified* which is not supported by the passage. The author states that it was *an event intended to protest the killing*. The words *were justified* makes a claim stronger than that in the passage. Eliminate it. Choice (B) uses the extreme wording *they were mistaken* which is not supported by the passage. The author states that it was a *peaceful rally ... an event intended to protest the killing*. The author does not imply that the labor leaders were *mistaken in their belief*. Eliminate it. Choice (C) uses the extreme language *they could have taken extra steps*, which makes a claim stronger than that in the passage. The author does not imply that labor leaders could have taken extra measures to insure *safety*. Eliminate it. Choice (D) uses the extreme language *they subtly implied...that the use of violence would not be discouraged*, which makes a claim stronger than that in the passage. Eliminate it. Choice (E) is supported by the passage which states that it was *an event intended to protest the killing* and the protest *actually carried it forward into the next century*. Keep this choice. The correct answer is (E).

Reading Comprehension Practice (page 122)

1. C

The subject of the question is the passage as a whole. The task is indicated by the phrase *primary purpose of the passage*. To answer the question, analyze the passage and determine why the author wrote it. The first sentence of the passage claims that *a handful of investigators assert that play serves no function in the development of predatory skills, such as stalking and killing prey*. The author then discusses their findings and points out a shortcoming. *Unfortunately, these experiments would only elucidate the developmental effects of sibling wrestling rather than the effects of all forms of play*. In the second paragraph, the author discusses *new research into positive social interaction after a childhood of play*. He then concludes that *animals exposed to early play exhibit slightly better coordination and less cognitive-impairing stress in adulthood; therefore, the advantages of play in evolved predatory skills should be recognized*. So, his primary purpose is to offer a discussion of the function that play serves in the development of predatory skills and he sides in favor of it. Choice (A) is too narrow. The *proof*, in the second paragraph regarding the ground squirrel experiment, is not the *primary* purpose of the passage. Eliminate it. Choice (B) is a reversal of the author's purpose. The author does not *believe the correlation between play and survival skills*. The author states that *the advantages of play in evolved predatory skills should be recognized*. Eliminate this choice. Choice (C) is a paraphrase of the purpose of the passage. Keep this choice. Choice (D) is also a reversal of the author's purpose. His purpose is *not to recapitulate the conventional hypotheses* which is that *play serves no function in the development of predatory skills*. His purpose is to argue for the *advantages of play*. Eliminate it. Choice (E) uses the recycled language *predatory skills*. The primary purpose is not to emphasize their *value* but to argue for the *advantages of play*. Eliminate it. The correct answer is (C).

2. A

The subject of the question is *survival skills and play*. The task is indicated by the phrase *according to the author...which of the following notions...is valid*. To answer the question, evaluate each answer choice and determine whether it is supported by the passage. Choice (A) is supported by the second sentence of the passage that states *animals raised with a dearth of sibling wrestling nevertheless display normal levels of efficiency at catching their dinner, and they reason that if play were essential to hunting and fishing, then these animals would exhibit diminished talents*. So, there is *at least one* predatory skill (catching dinner) that isn't directly developed through play. Keep this choice. Choice (B) uses the comparison words *more valuable*. Although both *predatory skills* and *survival skills* are mentioned in the passage, they are not compared in this manner. Eliminate it. Choice (C) uses the comparison words *more essential*. Although both *sibling wrestling* and *other forms of play* are mentioned in the passage, they are not compared in this manner. Eliminate it. Choice (D) uses the extreme wording *a wide range in the quantity* which is not supported by the passage. Additionally, it is a reversal of fact. The author mentions *the advantages of play in evolved predatory skills*. He does not claim that animals *need* it in order to *develop* predatory skills. Again, the second sentence indicates the opposite: *animals raised with a dearth of sibling wrestling nevertheless display normal levels of efficiency at catching their dinner*. Eliminate it. Choice (E) uses the comparison words *more during*. Although the author mentions survival skills in *adulthood* and *youth*, they are not compared in this manner. Eliminate it. The correct answer is (A).

3. B

The subject of the question is the *ground squirrel experiment*. The task is indicated by the phrase *is valuable because*. To answer the question, review that section of the passage and determine the importance of the subject. The passage states *but new research into positive social interaction after a childhood of play – such as the experiment that proved a causal connection between ground squirrels that sparred as babies and their development into better mothers – demonstrates the falsity of this declaration*. The phrase *this declaration* refers to the previous sentence which states that the investigators *declare that enhanced survival skills are probably due to trial and error, rather than they neural pathways formed by play*. So, the importance of the ground squirrel experiment is that it is an example that demonstrates positive social interaction as a result of childhood play and counters the investigators' declaration regarding the importance of play to enhanced survival skills. Choice (A) uses the recycled language *better mothers* and *sparring babies*. The importance of the experiment is not the *reasons* for the development of better mothers. The importance is that it is an example that demonstrates positive social interaction as a result of childhood play and the importance of play to enhanced survival skills. Eliminate this choice. Choice (B) is a paraphrase of the information in the passage. Keep this choice. Choice (C) is similar to choice (A) in that the importance of the experiment is *not* the *characteristics of better mothering*. Eliminate it. Choice (D) is a reversal. The importance of the experiment is *not* that survival lessons come from a *myriad* of sources but that they are enhanced by *one* source – play. Eliminate it. Choice (E) uses the recycled language *trial and error* and *survival skills*. This is also a reversal. The point of the experiment is *not* that *trial and error* enhances the development of survival skill. The point is that *play* does. Eliminate it. The correct answer is (B).

Reading Comprehension Practice (page 124)

1. E

The subject of the question is the passage as a whole. The task is indicated by the phrase *primary purpose of the passage*. To answer the question, analyze the passage and determine why the author wrote it. The first sentence of the passage claims that *art historians describe an underlying split between Modernism... and Postmodernism*. The last sentence of the first paragraph claims that *there is what some scholars call a historical divergence between the two art periods, and so the very idea of a catalogue of Postmodernism before the mid-20th Century seems absurd*. The second paragraph mentions that *the divergent classifications can be problematic, especially for overlapping periods*. The last sentence claims that *divergent categorization forces a great variety of works into castes that, by definition, they resist*. So, the primary purpose is to discuss the divergent classification of Modernism and Postmodernism art and the problems associated with it. Choice (A) does not match the primary purpose. It is too narrow. Eliminate it. Choice (B) is a reversal. The purpose of the passage is *not* to demonstrate how a certain categorization is *more appropriate*. It is to discuss that it *can be problematic*. Eliminate it. Choice (C) uses the recycled language *popular culture*. The primary purpose is not the *necessity of a broader definition*. Eliminate it. Choice (D) is too narrow. Although the passage mentions the emergence of Postmodern art, that is not the *primary purpose* of the passage. Eliminate it. Choice (E) is a paraphrase of the information presented in the passage. Keep this choice. The correct answer is (E).

2. C

The subject of the question is *the divergent classifications*. The task is identified by the phrase *which of the following does the author state can result*. To answer the question, retrieve that information from the passage and determine which answer choice is supported by the text. In the middle of the second paragraph, the author claims that the *divergent classifications can be problematic especially for overlapping periods*. Further along the author claims that *minimalism and Pop Art are often considered Modern Art movements, despite the inspiration they drew from what we now consider Postmodern ideals*. The author concludes with *divergent categorization forces a great variety of works into castes that, by definition, they resist*. So the classification can result in improper categorization of some works. Choice (A) uses the recycled language *scholarly* and *historical* as well as the comparison word *comparable*. There is no such comparison to *other historical realities*. Eliminate it. Choice (B) is incorrect. The result is not *contemporary motivations*. It is improper categorization. Eliminate it. Choice (C) is a paraphrase of the information from the passage. Keep this choice. Choice (D) uses the recycled language *high culture*. Also, the result is not *inadequate use of recent modifications*. It is improper categorization. Eliminate it. Choice (E) is incorrect. The result is not *inadequate notation of the differences*. Again, it improper categorization. Eliminate it. The correct answer is (C).

3. B

The subject of the question is the passage as a whole. The task is identified by the phrase *best matches the structure*. To answer the question, analyze the passage and determine how it is organized. The first sentence of the passage claims that *art historians describe an underlying split between Modernism... and Postmodernism*. The last sentence of the first paragraph claims that *there is what some scholars call a historical divergence between the two art periods, and so the very idea of a catalogue of Postmodernism before the mid-20th Century seems absurd*. The second paragraph claims that *the divergent classifications can be problematic, especially for overlapping periods*. The last sentence concludes *divergent categorization forces a great variety of works into castes that, by definition, they resist*. So, the passage discusses the divergence of the two periods and then the problems associated with it. Now check the answer choices to find one that matches that structure. Choice (A) is a reversal. Although, two schools of the thought are examined (Modernism and Postmodernism) *support for one of them* is not offered. Eliminate it. Choice (B) is a paraphrase of the structure of the passage. Keep this choice. Choice (C) uses the extreme language *proven to be true* and *proven nonexistent*. It is also a reversal because the benefits are *not proven to be true* and the pitfalls are not *proven nonexistent*. Eliminate it. Choice (D) uses the extreme language *to abolish it* and it does not match the structure. The two perspectives are *not defined* to abolish the discrepancy. Eliminate it. Choice (E) does not match the structure. *Two routes around the obstacle* are not offered and a *methodology unifying aspects of both* is not advised. Eliminate it. The correct answer is (B).

Reading Comprehension Practice (page 126)

1. A and B

The subject of the question is *the Big Bang Theory*. The task is identified by the phrase *according to the passage...posits that*. To answer the question, retrieve that information from the passage. The first sentence of the passage states that *the Big Bang Theory – which states that the universe exploded into existence out of nothing nearly 14 billion years ago – does not explain why the universe contains so little homogeneity*. Now check the answer choices to determine which matches the passage. Choice (A), *generated from a void*, is a paraphrase of *out of nothing* in the passage. Keep this choice. Choice (B), *a finite number of years ago*, is a paraphrase of *nearly 14 billion years ago* in the passage. Keep this choice. Choice (C) is a reversal. The Big Bang Theory *does not indicate that there is very little homogeneity*. According to the passage, it does not *explain why* there is very little homogeneity. Eliminate it. The correct answer is (A) and (B).

2. C

The subject of the question is *the Scale-Symmetry Theory*. The task is identified by the phrase *answers all of the following questions EXCEPT*. To answer this EXCEPT question, analyze the section in the passage regarding the Scale-Symmetry Theory. Then, evaluate the answer choices to determine which is NOT answered by information in the passage. The passage claims that *according to the Scale Symmetry Theory, the universe...may lack a consistent, external scale to describe mass and length. Theoretical models of scale-less particles interacting describe characteristics such as electric charge or antimatter that determine sizes and shapes based on inter-particle interactions. The lumps of space-less structures between celestial gravitational fields that we find today may not be quantifiable by standard yardsticks*. Now check the answer choices. Choice (A) is answered by *may lack a consistent, external scale to describe mass and length*. Eliminate it. Choice (B) is answered by *characteristics such as electric charge or antimatter that determine sizes and shapes based on inter-particle interactions*. Eliminate it. Choice (C) asks what generated the motion needed to cause particles to interact. Although the theory discusses particle interaction, it does not explain *what generated the motion*. Keep this choice. Choice (D) is answered by *characteristics such as electric charge or antimatter that determine sizes and shapes based on inter-particle interactions*. Eliminate it. Choice (E) is answered by *the lumps of space-less structures between celestial gravitational fields that we find today may not be quantifiable by standard yardsticks*. Eliminate it. The correct answer is (C).

3. E

The subject of the question is the passage as a whole. The task is identified by the phrase *describes the structure*. To answer the question, analyze the passage and determine how it is organized. The first sentence mentions the features of the Big Bang Theory and states that it *does not explain why the universe contains so little homogeneity*. The rest of the passage refers to the Scale Symmetry Theory which offers a potential solution. *The lumps of space-less structures between celestial gravitational fields that we find today may not be quantifiable by standard yardsticks. Homogeneity, or lack thereof, would be better imagined as a misinterpretation of measurement itself.* Now check the answer choices to find one that matches that structure. Choice (A) states that one hypothesis is *transformed* into a wholly different one. This does not match the structure of the passage. The Big Bang Theory is not *transformed* into the Scale Symmetry Theory. They are two separate theories. Eliminate it. Choice (B) states *both* of which are shown to be *deficient*. That's a reversal. The passage mentions the deficiency of the Big Bang Theory but it does not show that the Scale Symmetry Theory is deficient. Eliminate it. Choice (C) does not provide the structure of the *entire* passage. It only describes the structure of the first sentence and doesn't reference the Scale Symmetry Theory at all. Eliminate it. Choice (D) does not match the structure of the passage. While the *divergences* of the two theories are discussed (explanation for lack of homogeneity) the *parallels* are not. Eliminate it. Choice (E) is a paraphrase of the structure of the passage. *A problematic point with a theory is mentioned* (Big Bang Theory and lack of explanation regarding homogeneity) *and a possible theoretical solution described* (Scale Symmetry Theory). Keep this choice. The correct answer is (E).

Lesson 4 Math

Geometry Drill (page 156)

1. A

Draw the figure and label the information provided. If $PR = QR$, then triangle PQR is isosceles and the degree measure of $\angle QPR$ equals the degree measure of $\angle PQR$. If the sum of the degree measures of the 3 angles in a triangle is 180° and the measurement of $\angle PRQ$ is 55° , then there are $180 - 55 = 125$ degrees for the two remaining angles. Since the angles are equal, the measurement of each is $125 \div 2 = 62.5$ degrees. If the sum of the degree measures of two adjacent angles on a line is 180° , and $\angle QPR$ is adjacent to the angle with the degree measurement of x , then $x = 180 - 62.5 = 117.5$. So, Quantity B is 117.5. Since Quantity A is greater, the correct answer is (A).

2. B

If the flags are in the shape of a right triangle with legs of length 5 and 12, then based on the Pythagorean triple 5-12-13, the hypotenuse has a length of 13. The perimeter is then $5 + 12 + 13 = 30$. If the company has a total of 8,250 feet of trim, then the greatest number of flags it can make is $8,250 \div 30 = 275$. The correct answer is (B).

3. A, B, F, H

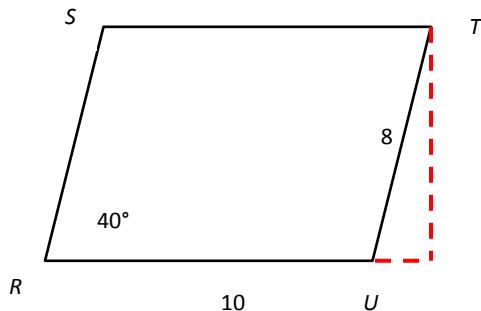
The area of the corral is 1,500 feet and the formula for the area of a rectangle is $A = l \times w$. In order for an answer to be one side of the corral, it must be a factor of 1,500. The prime factorization of 1,500 is $2^2 \times 3 \times 5^3$. Choice (A), 25, is a factor of 1,500 and $25 \times 60 = 1,500$. If one side is 25, then the other two sides are 25 and 60 since $25 + 25 + 60 = 110$ which equals three sides of the fence. So, select choice (A) as well as choice (H), 60. Choice (B), 30, is a factor of 1,500 and $30 \times 50 = 1,500$. If one side is 30, then the other two sides are 30 and 50 since $30 + 30 + 50 = 110$. So, select choice (B) as well as choice (F), 50. Choice (C), 35, choice (D), 40, Choice (E), 45, and choice (G), 55 are not factors of 1,500. Eliminate those choices. The correct answer is (A), (B), (F), (H).

4. C

The question states that the centers of the three circles are on line segment AC and are tangent (touching) at points A , B and C . Since the diameter is the chord that passes through the center of the circle, AC is the diameter of the largest circle, AB is the diameter of the medium circle, and BC is the diameter of the smallest circle. Plug In values for the diameters of the circles, such as $AC = 10$, $AB = 7$ and $BC = 3$. Since the formula for the circumference of a circle is $C = \pi D$, the circumference of the largest circle is 10π , the circumference of the medium circle is 7π , and the circumference of the smallest circle is 3π . Therefore, the ratio of the circumference of the largest circle to the sum of the circumferences of the two smaller circles is 10π to $(7\pi + 3\pi)$ or 10π to 10π which is 1 to 1. The correct answer is (C).

5. A

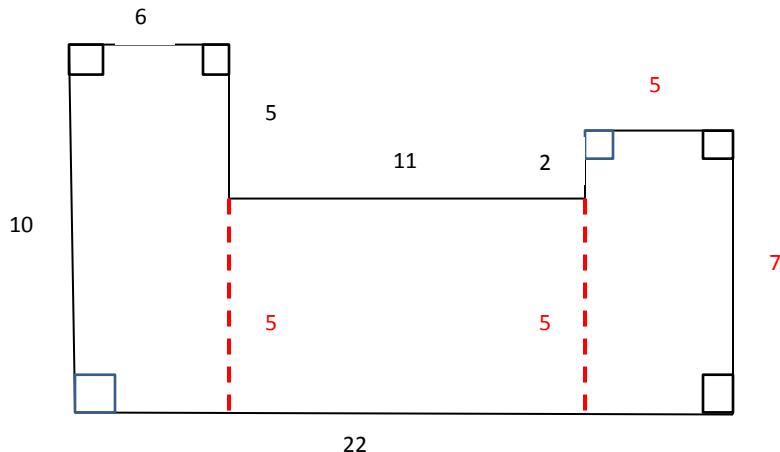
Draw the figure and label the information provided. Since the measure of the interior angle of the parallelogram is 40° , it is clear that the parallelogram is not a rectangle (if it was a rectangle, the degree measure of the interior angle would be 90°). The formula for the area of a parallelogram is $A = b \times h$ and the height is perpendicular to the base, RU . Draw a vertical height from vertex T as shown below.



The line drawn for the height creates the leg of a right triangle. The hypotenuse of that triangle is the side of the parallelogram with a length of 8. Therefore, the length of the leg of the triangle, which is also the height of the parallelogram, must be less than the length of the hypotenuse which is 8. If the $\text{Area} = \text{base} \times \text{height}$ (which is a number less than 8), then the area of the parallelogram is less than 80 and Quantity B is less than 80. Quantity A is greater. The correct answer is (A).

6. 150

For questions involving strange-looking figures, find familiar shapes. Draw lines in the figure to create 3 rectangles as shown.



Since the formula for the area of a rectangle is $A = l \times w$, the area of the rectangle on the left is $10 \times 6 = 60$. The area of the middle rectangle is $5 \times 11 = 55$. If the entire length of the figure is 22, then the length of the last rectangle is $22 - (6 + 11) = 5$. So, the area of the last rectangle is $7 \times 5 = 35$. Therefore, the area of the entire figure is $60 + 55 + 35 = 150$.

7. B

Draw the figure and label the information provided. To find the area of the shaded region, first find the area of triangle ACE and then subtract the area of the unshaded region. Since all the sides are equal, triangle ACE is equilateral. Draw a line for its height which creates two 30° - 60° - 90° triangles. The ratio of the sides in a 30° - 60° - 90° triangle is $x : x\sqrt{3} : 2x$. If the side opposite the 90 degree angle is $2x = 8$, then $x = 4$, and the

height is $x\sqrt{3} = 4\sqrt{3}$. Now, use the formula for the area of a triangle: $A = \frac{1}{2}bh$. In this

case, $A = \frac{8(4\sqrt{3})}{2} = 16\sqrt{3}$. Since the area of the triangle is $16\sqrt{3}$, the area of the

shaded region must be less than that, so eliminate answer choices (C), (D) and (E). Now, find the area of the unshaded region which is triangle BCD. Since B and D are midpoints, BC and CD each has a length of 4. The line that was drawn for the height of triangle ACE also creates the height of triangle BCD and creates two 30° - 60° - 90° triangles. If the side opposite the 90 degree angle is $2x = 4$, then $x = 2$, and the height is $x\sqrt{3} = 2\sqrt{3}$. The

area of triangle BCD is then $A = \frac{4(2\sqrt{3})}{2} = 4\sqrt{3}$. Therefore, the area of the shaded

region is $16\sqrt{3} - 4\sqrt{3} = 12\sqrt{3}$. The correct answer is choice (B).

8. C

Draw the figure and label the information provided. To find the area of rectangle $HGKJ$, use the formula for the area of a rectangle: $A = l \times w$. $JK = 3$. However, the length of HJ is not provided. Notice that HJ is the hypotenuse of right triangle HIJ . Since the legs HI and IJ have lengths of 5 and 12 respectively, then based on the Pythagorean triple 5-12-13, the hypotenuse $HJ = 13$. Therefore, the area of rectangle $HGKJ$ is $13 \times 3 = 39$. Since the two quantities are equal, the correct answer is (C).

9. D

Draw the figure and label the information provided. When two parallel lines are intersected by a third line, *big* angles (with a measure *greater* than 90°) and *small* angles (with a measure *less* than 90°) are formed. All big angles are equal and all small angles are equal. In this figure, x is the measure of the big angle. The small angle has a measure of 65° . Since the measure of any big angle plus the measure of any small angle equals 180° , $x = 180 - 65 = 115$. The correct answer is (D).

10. D

Draw the figure and label the information provided. Since A and C are the centers of the two circles, draw a line connecting A and C . AC is the radius of each circle. AB is also a radius and so is CB . Since all radii are equal, triangle ABC has three equal sides and is an equilateral triangle. Equilateral triangles have three equal angles, each with a measure of 60° . Therefore, the degree measurement of x is 60 . The correct answer is (D).

Lesson 4 Verbal

Reading Comprehension Practice (page 180)

1. A

The subject of the question is *Wright's designs*. The task is indicated by the phrase *the passage suggests* that the designs *embodied a rejection of*. To answer the question, retrieve that information from the passage. The first sentence of the second paragraph claims that *his designs...reflect an intense interest in organic integration of place with structure*. The last sentence of the second paragraph mentions his Robie House that shared *an aversion to mass production and the embrace of handcrafting*. The first sentence of the third paragraph claims that *due to Wright's innovations, the neoclassical Greek Revival that had so stultified American architecture during the nineteenth century was at last stopped in its tracks*. So, Wright's designs embraced organic integration of place with structure and rejected mass production and neoclassical Greek Revival.

Choice (A), *rebirth of well-known traditional designs*, is a paraphrase of *neoclassical Greek Revival* in the passage. Keep this choice. Choice (B) uses the extreme language *excessively nationalistic form* that is not supported by the passage. Eliminate it. Choice (C) uses the comparison words *more important*. There is no such comparison of the *method of creation* and *the result*. Eliminate it. Choice (D) uses the recycled word *preoccupation* and is a reversal. Wright did not reject *natural organic forms*. He had *an intense interest* in them. Eliminate it. Choice (E) uses the extreme word *obsession* which is a memory trap for *preoccupation* in the last sentence of the passage which claims that the Guggenheim Museum was *Wright's take on modernism's preoccupation with geometry*. So, this choice is a reversal because it was *modernism's preoccupation with geometry* not Wright's. Additionally, it is a reversal because Wright did not reject *modernist geometry* since the Guggenheim was his *take on modernism*. Eliminate this choice. The correct answer is (A).

2. C

The subject of the question is *the Prairie School*. The task is indicated by the phrase *can be inferred from the passage*. To answer this inference question, determine what the passage claims about the Prairie School and then evaluate the answer choices to determine which is supported by the text. The passage claims in the second paragraph that Wright's designs, *which are now viewed as part of the Prairie School of architecture, were inspired by long walks... his Robie House ...also shared many qualities with the designs of John Ruskin and with the English Arts and Crafts movement of that period...* So, the Prairie School was an architectural style whose qualities were shared by the architects of that period. Choice (A) uses the extreme word *founded by*. The passage claims that Wright's designs *are now viewed as part of the Prairie School*. It does not indicate that Wright *founded* it. Eliminate it. Choice (B) uses the recycled language *English Arts and Crafts movement* as well as the extreme word *outgrowth*. The passage states that the Robie House *shared many qualities* with the English Arts and Crafts movement not that the Prairie School was an *outgrowth* of it. Eliminate it. Choice (C) is a paraphrase of the information presented in the passage. Keep this choice. Choice (D) uses the extreme wording *first original American movement* which is not supported by the passage. Eliminate it. Choice (E) uses the phrase *little effect outside of the Upper Midwest* which is a reversal. The passage claims that *his Robie House, in particular, was cited as an influence in Europe*. So, it had an effect outside of the Upper Midwest. Eliminate it. The correct answer is (C).

3. D

The subject of the question is *Wright*. The task is indicated by the phrase *the passage suggests that Wright would mostly likely have strongly objected to*. To answer this inference question, evaluate the answer choices and determine which is supported by the text. Choice (A) is a reversal. The Guggenheim Museum was *Wright's take on modernism's preoccupation with geometry* so that does not support the idea that Wright would object to a modern design that failed to follow the principles of simplicity. Eliminate it. Choice (B) mentions a *sheet of particleboard that had been customized to customer specifications*. There is no indication in the passage that Wright would object to this. He had an *aversion to mass production* but that was in terms of architectural design. Eliminate it. Choice (C) is a reversal. Wright had an *aversion to mass production* and clearly, hotels in the form a swan and a dolphin are not *mass produced*. So, Wright would not object to this. Eliminate it. Choice (D) mentions a *second home at the beach that had originally been designed for a city*. Wright would object to this because of his *intense interest in organic integration of place with structure* which this example clearly is not. Keep this choice. Choice (E) mentions an *open floor plan* which Wright would not object to. However, he would object to *shrouded in darkness* since he was in favor of rooms *flooded with natural light*. Since this choice is only partially correct, it is not the choice that Wright would *most strongly* object to. Eliminate it. The correct answer is (D).

Reading Comprehension Practice (page 182)

1. C

The subject of the question is the *volcanoes along the Nazca-South American fault*. The task is identified by the phrase *the passage suggests*. To answer this inference question, determine what the passage states about the subject and then evaluate the answer choices to determine which is supported by the passage. The passage claims in the third sentence that *energies released by earthquakes can also trigger other events that cause seismic activity*. Stevenson contends that volcanic activity along the fault will be triggered by the recent earthquakes. These volcanoes will shake up the interior of the Earth when they erupt, shifting rocks around and destabilizing the crust along the fault line. With the fault disturbed anew, the risk of another earthquake will also increase. So, the earthquakes trigger the volcanoes which in turn increase the risk of another earthquake. Choice (A) is a reversal. They would not erupt *less frequently* if more earthquakes occurred. They would erupt *more frequently*. Eliminate this choice. Choice (B) is also a reversal. They don't *relieve the stresses*. They *shake up the interior of the Earth when they erupt, shifting rocks around and destabilizing the crust along the fault line*. Additionally, the answer choice refers to *distant faults*. The passage is only concerned with faults *in the area*. Eliminate it. Choice (C) is true since it is a paraphrase of the information in the passage. Keep this choice. Choice (D) uses the comparison words *more likely to cause*. There is no such comparison in the passage of earthquakes caused by *erupting* to earthquakes caused by *destabilizing the earth's interior*. Eliminate it. Choice (E) uses the recycled language *tectonic* and *seismic* as well as the comparison words *more likely*. There is no such comparison of the causes of volcanoes by *tectonic energy to other seismic events*. Eliminate it. The correct answer is (C).

2. A

The subject of the question is *earthquakes along the Nazca-South American fault*. The task is indicated by the phrase *it can be inferred from the passage that Stevenson might conclude*. To answer this inference question, determine what the passage states about the subject and then evaluate the answer choices to determine which is supported by the passage. The first sentence of the passage states that *Stevenson argues that the recent earthquake activity in the Andes Mountains might result in even more earthquakes in the area*. In the fourth sentence, the passage states that *Stevenson contends that volcanic activity along the fault will be triggered by the recent earthquakes. These volcanoes will shake up the interior of the Earth when they erupt, shifting rocks around and destabilizing the crust along the fault line. With the fault disturbed anew, the risk of another earthquake will also increase*. Now check the answer choices. Choice (A) is supported by the passage. The eruption of the volcanoes destabilizes *the crust along the fault line* which in turn increases *the risk of another earthquake*. If there were no volcanoes near the fault line, then the crust would not be destabilized thereby reducing the frequency of the earthquakes. Keep this choice. Choice (B) is a reversal. The earthquakes are not *powered by energies released from other earthquakes*. They are powered by the *volcano eruptions*. Eliminate this choice. Choice (C) uses the comparison words *greater strength*. Stevenson's claim is about the *frequency* of the earthquakes not the *strength*. Eliminate this choice. Choice (D) is a reversal. The earthquakes are not more regular in the *absence* of disturbed faults. They are more regular in the *presence* of disturbed faults. Eliminate it. Choice (E) is also a reversal. It is not the *earthquakes* that shake up rocks in the Earth's interior and destabilize the crust. It is the *volcanoes* that do that. Eliminate it. The correct answer is (A).

3. E

The subject of the question is *Nazca-South American tectonic fault line*. The task is indicated by the phrase *according to the passage, which of the following is true*. To answer the question, evaluate the answer choices and determine which is supported by the passage. Choice (A) uses the extreme wording *dangerously active* which is not supported by the passage. The passage mentions *the recent earthquake activity* in the first sentence. There is no indication that it is *dangerously active*. Eliminate it. Choice (B) is a reversal. The fault's *stability* is not ensured through seismic activity. According to the passage, seismic activity *destabilizes* the crust along the fault line. Eliminate it. Choice (C) uses the extreme wording *greatly increased* which is not supported by the passage. In the first sentence, the passage states that earthquake activity *might result* in even more earthquakes. Thus, it is not *greatly increased*. Eliminate it. Choice (D) is a reversal. Earthquakes don't *preserve* the pent-up energy. The second sentence of the passage states that earthquakes *release* pent-up energy under the Earth's surface. Eliminate it. Choice (E) is supported by the passage which states that Stevenson *contends that volcanic activity along the fault will be triggered by the recent earthquakes*. Keep this choice. The correct answer is (E).

Reading Comprehension Practice (page 184)

1. C

The subject of the question is *LeGuin*. The task is indicated by the phrase *the author of the passage cites...in order to*. To answer the question, analyze the passage and determine the reason that the author mentions LeGuin. In the first sentence, the author claims that *the criticism of electronic books, or ebooks, by literary scholars reveals as much about their confusion as it does about their elitism*. As supporting evidence, he states that *many screeds have been penned by such well-known professional authors as Ursula K. LeGuin promoting the pleasures of the literary experience in printed form*... So, the author mentions LeGuin as an example of a literary scholar who criticizes ebooks. Choice (A) uses the comparison words *more likely*. There is no such comparison in the passage of criticisms of ebooks leveled by women to those leveled by men. Eliminate it. Choice (B) uses the comparison words *command the same amount*. There is no such comparison in the passage of the attention that critics command. Eliminate it. Choice (C) is a paraphrase of the reason that the author mentions LeGuin. Keep this choice. Choice (D) uses the extreme wording *strictly utilitarian* and *unproductive* which is not supported by the passage. The author mentions that LeGuin promotes *the pleasures of the literary experience* but there is no comparison to the productiveness of reading ebooks. Eliminate it. Choice (E) uses the extreme wording *undue reverence*. Although LeGuin is a well-known professional author, there is no indication that her promotion of the pleasures of the literary experience in printed form is considered *undue reverence*. Eliminate it. The correct answer is (C).

2. B and C

The subject of the question is *cheap thrills*. The task is identified by the phrase *supported by the passage*. To answer the question, determine what the passage states about *cheap thrills* and then evaluate the answer choices to determine which is supported by the text. The passage states *decrying the arrival of cheap, limitless digital stories, many of which are genre tales of romance, adventure, and mystery. Many of these same critics have on occasion shown their true bias – that reading remain a pastime of those sufficiently sophisticated to linger over a felicitous turn of phrase, and that published works avoid pandering to the masses eager for nothing more than cheap thrills.* So, “*cheap thrills*” is a reference to the desires of ebook readers. Choice (A) uses the extreme wording *difficult time understanding* and *lack the necessary sophistication* which is not supported by the passage. Although the author indicates that ebook critics have shown *their true bias – that reading remain a pastime of those sufficiently sophisticated to linger over a felicitous turn of phrase*, there is no indication that readers of genre fiction have a *difficult time understanding the subtleties of literary fiction because they lack the necessary sophistication*. Eliminate it. Choice (B) matches the passage regarding *cheap, limitless digital stories*. Keep this choice. Choice (C) mentions *visceral entertainment* which is supported by *genre tales of romance, adventure, and mystery* in the text. Keep this choice. The correct answer is (B) and (C).

3. B

The subject of the question is *pandering*. The task is indicated by the phrase *most nearly means*. To answer this Vocab in Context question, find the word *pandering* in the passage and determine its meaning from the context. In the last sentence, the passage states *many of these same critics have on occasion shown their true bias – that reading remain a pastime of those sufficiently sophisticated to linger over a felicitous turn of phrase, and that published works avoid pandering to the masses eager for nothing more than cheap thrills.* The clue is *eager for nothing more than cheap thrills*. So, published works should avoid *satisfying* these needs. Now check the answer choices to find a word similar to “*satisfying*.” Choice (A), *disappointing*, is not a good match. Eliminate it. Choice (B), *catering*, is a good match. Keep this choice. Choice (C), *challenging*, choice (D), *joining*, and choice (E), *lowering*, are not good matches. Eliminate them. The correct answer is (B).

Reading Comprehension Practice (page 186)

1. But his popularity has been severely undercut...

The subject of the question is the *range of reasons for the change in perspective on Jackson's presidency*. The task is indicated by the phrase, *select the sentence*. To answer the question, identify the sentence in the passage with that function. Label each sentence as a letter and evaluate them one at a time. The first sentence is a question asking whether Andrew Jackson was a great president. Since there is no mention of the reasons for the change in perspective, eliminate it. The second sentence mentions the obviousness of the answer to the question. Since there is no mention of the reasons for the change in perspective, eliminate it. The third sentence mentions the reason why his reputation in popular history was solidified. Since there is no mention of the reasons for the change in perspective, eliminate it. The fourth sentence mentions the reasons for the change in perspective on Jackson's presidency: *his treatment of Native Americans and his imposition of the Specie Circular*. The last sentence mentions the reluctance to maintain his stature as a top-tier president due to the mixed nature of his accomplishments. While this sentence does provide a reason for the change in perspective, it does not provide a *range of reasons*. Eliminate it. The correct answer is the fourth sentence in the passage: *But his popularity has been severely undercut by twentieth-century historians' reevaluation of other portions of his presidency, particularly his treatment of Native American and his imposition of the Specie Circular*.

2. D

The subject of the question is the *contradictions* one must confront to evaluate *Jackson's presidency*. The task is indicated by the phrase the *passage suggests*. To answer this inference question, determine what the passage states about the subject and then evaluate the answer choices to determine which is supported by the text. The passage states that *his reputation in popular history was solidified by his refusal, as the first president to hail from outside the hallowed enclaves of Virginia and Massachusetts to recharter the National Bank for a third time. But his popularity has been severely undercut by twentieth-century historians' reevaluation of other portions of his presidency, particularly his treatment of Native American and his imposition of the Specie Circular*. So, the contradiction is his appropriate handling of the National Bank versus his treatment of Native Americans and his imposition of the Specie circular. Choice (A) is a memory trap of the portion of the sentence that states *the first president to hail from outside the hallowed enclaves of Virginia and Massachusetts*. The contradictions that the question references do not relate to *Jackson's awareness of his place of birth*. Eliminate it. Choice (B) uses the recycled language *Lincoln and Roosevelt*. The contradictions that the question references do not relate to *the gap between Jackson's achievements and those of Lincoln and Roosevelt*. Eliminate it. Choice (C) uses the recycled words *National Bank* and *national currency* is a memory trap for *his status on the twenty-dollar bill*. This choice is incorrect because the contradictions that the question references do not relate to the *irony in placing the man who closed the National Bank onto the national currency*. Eliminate it. Choice (D) is a paraphrase of the information in the passage regarding the contradictions. Keep this choice. Choice (E) uses the recycled language *popular* and *twentieth-century*. Additionally, the word *tension* is extreme and not supported by the text. Finally, the contradictions that the question references do not relate to *popular opinion*. Eliminate it. The correct answer is (D).

3. B

The subject of the question is *presidents who resided in the “hallowed enclaves”*. The task is indicated by the phrase *it can be inferred*. To answer this inference question, determine what the passage states about the subject and then evaluate the answer choices to determine which is supported by the text. The third sentence of the passage claims that *his reputation in popular history was solidified by his refusal, as the first president to hail from outside the hallowed enclaves of Virginia and Massachusetts to recharter the National Bank for a third time*. Now evaluate the answer choices. Choice (A) uses the recycled word *historians*. Additionally, the word *lionized* is extreme and not supported by the text. Eliminate this choice. Choice (B) is supported by the text. If Jackson was the *first president* to refuse to recharter the National Bank, then his predecessors must have supported the National Bank. Keep this choice. Choice (C) uses the recycled language *Native Americans*. There is no indication that Jackson’s predecessors were *in favor of expanded rights for Native Americans*. Eliminate it. Choice (D) uses outside knowledge. The passage only indicates that Jackson is featured on the twenty-dollar bill. It does not claim that his predecessors were *featured on American currency*. Eliminate it. Choice (E) uses outside knowledge. There is no indication in the passage that his predecessors were *participants in the American Revolution*. Eliminate it. The correct answer is (B).

Lesson 5 Math

Charts Drill (page 196)

1. B

To answer this question, use the information in the table. Since the question asks about *percent increase*, use the percent change formula: $\frac{\text{difference}}{\text{original}} \times 100$. For choice (A),

Children's Services, the percent increase is $\frac{228 - 211}{211} \times 100 \approx 8\%$. Choice (B), Hostels is

$\frac{62 - 48}{48} \times 100 \approx 29\%$. Choice (C), Public Health is $\frac{96 - 89}{89} \times 100 \approx 8\%$. Choice (D), Social

Development *decreased* from \$9,000,000 to \$8,000,000, so eliminate this choice. For choice (E), Social Services, the percent increase is $\frac{1,153 - 906}{906} \times 100 \approx 27\%$. Therefore,

Hostels had the greatest percent increase at approximately 29%. The correct answer is (B).

2. 300

To answer this question, use the pie chart. City T's Community Services expenditures in 1998 is 44% of \$5.6 billion. Public Works expenditures in 1998 is 11% of \$5.6 billion. Use the percent change formula: $\frac{\text{difference}}{\text{original}} \times 100$ for the calculation and translate the

information in the question into the equation. $\frac{44\%(5.6B) - 11\%(5.6B)}{11\%(5.6B)} \times 100$. Since the

\$5.6 billion factors out, the calculation can be done with just the percentages.

$\frac{44\% - 11\%}{11\%} \times 100 = \frac{33\%}{11\%} \times 100 = 300\%$. The correct answer is 300.

3. A, C

The question asks what can be *inferred* from the graph or the table. So, determine which of the statements *must be true* based on the information in the charts. For choice (A), use the table and then the pie chart. The amount spent on Social Services in 1998 is \$1,153 billion. The total Community Services expenditures in 1998 is \$2,464 billion.

Therefore, Social Services is $\frac{1,153}{2,464} \approx \frac{1}{2}$ of Community Services. If Community Services is

44% of the total expenditures, then Social Services is $\frac{1}{2} \times 44\% \approx 22\%$. Since all the other

programs are less than 22%, more was spent on Social Services than any other area. The first statement is true, so select choice (A). For choice (B), use the pie chart. Community Services expenditures in 1998 is 44%. The next four most highly funded areas are Public Transit 14%, Other 12%, Public Works 11%, and Police 8%. The total for these four areas combined is $14 + 12 + 11 + 8 = 45\%$ which is greater than 44%. Therefore, choice (B) is not true. Eliminate it. For choice (C), use the table. In 1997, Library expenditures is \$121 million which is greater than Public Health expenditures at \$89 million. In 1998, Library expenditures is \$117 million which is greater than Public Health expenditures at \$96 million. Since Library expenditures is greater for both years, this statement is true.

Select choice (C). The correct answer is (A) and (C).

4. B

The question asks for the *least* decrease in unemployment rate from 1998 to 1999. For choice (A), Northeast, the decrease is $4.7 - 4.4 = 0.3$. Choice (B), Midwest, is $3.7 - 3.6 = 0.1$. Choice (C), South, is $4.4 - 4.1 = 0.3$. Choice (D), West, is $5.4 - 4.9 = 0.5$. Choice (E), Pacific, is $5.7 - 5.2 = 0.5$. Therefore, the Midwest has the least decrease at 0.1. The correct answer is (B).

5. 27

According to the bar graph, the unemployment rate for the Northeast region in 1999 is 4.4% of the population 16 years or older. So translate the question into an equation. The question is: \$1.2 million is 4.4% of what number? The equation is then

$$1.2 \text{ million} = \frac{4.4}{100} x \text{ (where } x \text{ represents the overall population in the Northeast region)}$$

Now, solve for x . The result is $120 \text{ million} = 4.4x$ and $x = 27.27 \text{ million}$. Since the question asks for the answer to the nearest million, the correct answer is 27.

6. D

Since the question asks about *percent decrease*, use the percent change formula:

$\frac{\text{difference}}{\text{original}} \times 100$. For choice (A), Northeast, the percent decrease is

$\frac{4.7 - 4.4}{4.7} \times 100 \approx 6.4\%$. Choice (B), Midwest, is $\frac{3.7 - 3.6}{3.7} \times 100 \approx 2.7\%$. Choice (C),

South, is $\frac{4.4 - 4.1}{4.4} \times 100 \approx 6.8\%$. Choice (D), West, is $\frac{5.4 - 4.9}{5.4} \times 100 \approx 9.3\%$. Choice (E),

Pacific, is $\frac{5.7 - 5.2}{5.7} \times 100 \approx 8.8\%$. Therefore, the region with the greatest percent

decrease is the West at 9.3%. The correct answer is (D).

Range and Standard Deviation Drill (page 206).

1. D

Translate the information in the question into an equation. Using m for the mean and s for the standard deviation, *the measurement 14.2 is 0.75 standard deviations above the mean* translates to $14.2 = m + 0.75s$. The statement *the measurement 17.2 is 3.25 standard deviations above the mean* is $17.2 = m + 3.25s$. Since there are two equations with 2 variables, these are simultaneous equations. Stack the equations. Notice that by subtracting the first equation, the variable m cancels out and the value of s can be determined.

$$17.2 = m + 3.25s$$

$$\underline{-(14.2 = m + 0.75s)}$$

$$3.0 = 2.5s$$

$$\text{So, } s = 1.2$$

Now plug in $s = 1.2$ into either equation to solve for m . Using the first equation: $14.2 = m + 0.75(1.2)$. Thus, $14.2 = m + 0.9$ and $m = 13.3$. The correct answer is (D).

2. E

Standard deviation describes the spread of data from the mean. Each of the answer choices is an equation of the form $y = ax + b$. For every value of x from 51 to 150, the corresponding y value is $ax + b$. The greater the absolute value of a in each equation, the greater the spread of each y value from the mean. The absolute value of a is greatest in the equation $y = 6x + 2$. The correct answer is (E).

3. A, B, D

The *range* is the difference between the greatest and the least numbers in a data set. The range of list L is then $15 - (-15) = 30$. Now, check the answer choices and select any answer with a range of 30. For choice (A), the range is $38 - 8 = 30$. Select choice (A). For choice (B), the range is $32 - 2 = 30$. Select choice (B). For choice (C), the range is $15 - 0 = 15$. Eliminate it. For choice (D), the range is $24 - (-6) = 30$. Select choice (D). For choice (E), the range is $20 - (-20) = 40$. Eliminate it. The correct answer is (A), (B), (D).

Comprehensive Drill (page 208)

1. A

To compare the two quantities, rewrite using common bases. Since the MADSPM rules don't apply to the expression in Quantity A, look for ways to factor. $5^{12} - 5^{10}$ can be factored and rewritten as $5^{10}(5^2 - 1) = 5^{10}(25 - 1) = 5^{10}(24)$. Now that the two quantities have the same base, it is clear that Quantity A is greater. The correct answer is (A).

2. B

This is a Quant Comp question with variables, so Plug In. Since the question restriction is that $x > 0$, first Plug In an easy number according to the restriction, such as $x = 2$.

Quantity A is $\frac{2}{2 + \frac{1}{2}} = \frac{2}{\frac{5}{2}} = \frac{4}{5}$. Since Quantity B is greater, eliminate answer choices (A) and (C). Now, Plug In again using FROZEN. Try $x = 1$. Now, Quantity A is

$\frac{2}{2 + \frac{1}{1}} = \frac{2}{2 + 1} = \frac{2}{3}$. Quantity B is still greater. Continue Plugging In until all the FROZEN options are exhausted. Regardless of which values are used, notice that since $x > 0$, the denominator in Quantity A is always greater than the numerator. Consequently, Quantity A is always less than 1. The correct answer is (B).

3. B

Use an Average Pie to determine the *Total* number of points for Emily and Katherine. The *# of things* is 2 and the *Average* is 80, so the *Total* is $2 \times 80 = 160$. Next, use another Average Pie to determine the *Total* number of points for Katherine and Julia. The *# of things* is 2 and the *Average* is 85, so the *Total* is $2 \times 85 = 170$. Now, find the difference between the two *Total* numbers to determine how many more points Julia scored. $170 - 160 = 10$. The correct answer is (B).

4. D

Since this question is about a *ratio*, draw a ratio box. The columns are **Alcohol**, **Water** and the **Total**. The ratio is unknown, but the question states that there is $\frac{1}{5}$ more alcohol than water. So Plug In a value for the water that is a multiple of 5 such as 25. If there is $\frac{1}{5}$ more alcohol, then the alcohol is $25 + 5 = 30$. Fill in those numbers in the

Actual Number row. Since both numbers are divisible by 5, the multiplier is 5. So the ratio is 6 : 5. The correct answer is (D). The completed ratio box looks like this:

| | Alcohol | Water | Total |
|---------------|---------|-------|-------|
| Ratio | 6 | 5 | 11 |
| Multiplier | 5 | 5 | 5 |
| Actual Number | 30 | 25 | 55 |

5. 46

Since the question refers to *two groups* (customers who order hamburgers and customers who order french fries), *neither* and *both*, this is a group problem. Use the group formula to solve the problem. Total = Group 1 + Group 2 – Both + Neither. Plug In the numbers from the question into the formula. $110 = 63 + 71 - \text{Both} + 22$. Now, solve for Both. $110 = 156 - \text{Both}$. So Both = 46. The correct answer is 46.

6. C

Draw the figure and label the information provided. If O is the center of the circle, then OM and ON are radii and triangle OMN is an isosceles right triangle. The degree measures of the angles of an isosceles right triangle are 45° - 45° - 90° and the ratio of the sides is $x : x : x\sqrt{2}$. Since MN , the side opposite the angle with the measure of 90° has a length of $\sqrt{2}$, the sides opposite the angles with a measure of 45° (OM and ON) are each 1. Therefore, the radius is 1. The formula for the area of a circle is $A = \pi r^2$. So, $A = \pi(1^2) = \pi$. The correct answer is (C).

7. E

Draw the figure and label the information provided. When two parallel lines are intersected by a third line, big and small angles are created. The big angles are equal and the small angles are equal. For this question, there are three parallel lines. $\angle EBC$ is a small angle and has a degree measure of 50. Notice that $\angle AEF$ is also a small angle and has a degree measure of 50. Extend line segment BA past point A . The angle created is also a small angle and has a degree measure of 50. Since opposite (or vertical) angles are equal, $\angle EAD$ which is opposite it, also has a degree measure of 50. If $ED = EA$, then triangle DEA is isosceles and $\angle EDA = \angle EAD$. Since the degree measure of both angles is 50, and the sum of the degree measures of the angles in a triangle is 180° ,
 $\angle DEA = 180 - (50 + 50) = 180 - 100 = 80$. The correct answer is (E).

8. B

Since there are variables in the answer choices, Plug In. Let $x = 20$ and $y = 30$. Now, translate the question into a proportion. $\frac{20 \text{ tires}}{30 \text{ min}} = \frac{1,272 + 20}{t}$. Next, cross multiply and solve for t . The result is $20t = 1,292(30)$ and $t = 1,938$. That is the target answer, so circle it. Now, check the answer choices. Choice (A) is $\frac{1,272 \times 30}{20} = 1,908$ which does not match the target, so eliminate it. Choice (B) is $30 + \frac{1,272 \times 30}{20} = 1,938$ which matches the target, so keep choice (B) and continue checking the remaining answer choices. Choice (C) is $30 + \frac{1,272 \times 20}{30} = 878$. Eliminate it. Choice (D) is $20 + \frac{1,272 \times 20}{30} = 868$. Eliminate it.

Choice (E) is $\frac{20^2 + 1,272 \times 20}{30} = 861.\bar{3}$. Eliminate it. The correct answer is (B).

9. $\frac{22}{60}$ or equivalent fraction

Since there is an unknown value (the number of books), and the answer choice is expressed as a fraction, this is a Hidden Plug In . The fractions in the question are $\frac{1}{4}$ and $\frac{3}{5}$, so Plug In a common denominator for the number of books that Bobbie has such as 20. If Fred has twice as many books as Bobbie does, then Fred has $20 \times 2 = 40$ books and their combined collection of books is $20 + 40 = 60$. One-fourth of Fred's books are signed, so he has $\frac{1}{4} \times 40 = 10$ signed books. If three-fifths of Bobbie's books are signed, then he has $\frac{3}{5} \times 20 = 12$ signed books. Therefore the combined number of signed books is $10 + 12 = 22$ and the fraction of the books that are signed is $\frac{22}{60}$. The correct answer is $\frac{22}{60}$ or an equivalent fraction. (Fractions don't need to be reduced to lowest terms for numeric entry questions).

10. C

If the diameter of circle R is 20 centimeters, then its radius is 10 centimeters. The formula for the area of a circle is $A = \pi r^2$. So the area of circle R is 100π . If the area of circle R is twice the area of circle S , then the area of circle S is $\frac{100\pi}{2} = 50\pi$. Now, Plug In that value into the formula for the area of a circle to determine the value of the radius of circle S .

$$50\pi = \pi r^2$$

$$50 = r^2$$

$$\sqrt{50} = r$$

$$\sqrt{25 \times 2} = r$$

$5\sqrt{2} = r$. The correct answer is (C).

Lesson 5 Verbal

Sentence Equivalence Drill (page 224)

1. C and E

The blank refers to the ink of the cephalopod. The clue is *unlike the bioluminescent plankton that lights up the ocean*. The contrasting transition word *unlike* indicates that the ink of the cephalopod is opposite of the plankton so the cephalopod creates *localized darkness*. So a good word for the blank is “creates.” Choice (A), *precludes*, and choice (B), *forestalls*, both mean prevents, so they are not good matches for “creates.” Eliminate choices (A) and (B). Choice (C), *engenders*, which means to produce, is a good match for “creates,” so keep this choice. Choice (D), *obviates*, which means to render unnecessary, is not a good match. Eliminate it. Choice (E), *induces*, is a good match for “creates.” Keep this choice. Choice (F), *negates*, is not a good match. Eliminate it. The correct answer is (C) and (E).

2. A and F

The blank refers to the island’s location relative to other land masses. The clue is *species not found anywhere else in the world due to the relatively small populations of these species and their inability to migrate elsewhere*. So a good phrase for the blank is “isolation from.” Choice (A), *sequestration from*, is a good match. So keep this choice. Choice (B), *adjacency to*, is not a good match. Eliminate it. Choice (C), *contiguity with*, which means close proximity or touching, is not a good match. Eliminate it. Choice (D), *association with*, is not a good match. Eliminate it. Choice (E), *derivation from*, which means origination from, is not a good match. Eliminate it. Choice (F), *isolation from*, matches the phrase for the blank. So keep this choice. The correct answer is (A) and (F).

3. B and C

The blank refers to the scientists’ response to the question of which variable caused the reaction. The clue is *ran successive tests for weeks but ultimately came no closer to achieving a resolution*. So a good word for the blank is “puzzled.” Choice (A), *appeased*, which means pacified or soothed, is not a good match. Eliminate it. Choice (B), *vexed*, which means irritated or tormented, is a good match. Keep this choice. Choice (C), *disquieted*, which means disturbed or made uneasy, is a good match. Keep this choice. Choice (D), *exonerated*, which means freed from blame, is not a good match. Eliminate it. Choice (E), *insinuated*, which means suggested or hinted slyly, is not a good match. Eliminate it. Choice (F), *mollified*, which also means pacified or soothed, is not a good match. Eliminate it. The correct answer is (B) and (C).

4. B and E

The blank refers to a trait among individuals. The clue is *despite the prevalent application of phrases such as popular belief and if it is well known as well as proclaim a shared dogma*. The contrasting transition word *despite* indicates that there *isn't* agreement. So there seldom tends to be even essential agreement. Use "agreement" as the word for the blank. Choice (A), *perturbation*, which means agitation, is not a good match. Eliminate it. Choice (B), *consensus*, is a good match. Keep this choice. Choice (C), *assignment*, which means appointment or engagement, is not a good match. Eliminate it. Choice (D), *precedence*, is not a good match. Eliminate it. Choice (E), *accord*, is a good match. Keep this choice. Choice (F), *dissension*, which means disagreement, is opposite in meaning of the word for the blank. Eliminate it. The correct answer is (B) and (E).

5. C and F

The blank refers to editorial and investigative pieces written by long-form journalists about new police uniforms. The clue is *drew rave reviews*. The contrasting transition word, *while*, indicates that clue is opposite in meaning of the word for the blank. . Additionally, the phrase *extravagant albeit stylish squandering of taxpayers' dollars* indicates that journalists did not rave about the uniforms. So a good word for the blank is "criticizing." Choice (A), *extolling*, and Choice (B), *lauding*, which both mean to praise, are opposite in meaning of the word for the blank. Eliminate these choices. Choice (C), *admonishing*, which means to reprove or scold, is a good match. Keep this choice. Choice (D), *advocating*, and choice (E), *endorsing*, which both mean support, are not good matches. Eliminate these choices. Choice (F), *castigating*, which means to criticize, is a good match. Keep this choice. The correct answer is (C) and (F).

6. A and E

The blank refers to a characteristic of the professor. The clue is *every assignment was returned with numerous corrections to the citation formatting and grammar but few on the actual substance*. So a good word for the blank is "nitpicker." Choice (A), *pedant*, which means someone who rigidly adheres to book knowledge, is a good match. Keep this choice. Choice (B), *maverick*, which means a rebel or nonconformist, is not a good match. Eliminate it. Choice (C), *sycophant*, which means a self-seeking flatterer, is not a good match. Eliminate it. Choice (D), *pundit*, which means an expert or authority, is not a good match. Eliminate it. Choice (E), *redactor*, which means an editor or someone who revises things, is a good match. Keep this choice. Choice (E), *savant*, which means a person of profound or extensive learning, is not a good match. Eliminate it. The correct answer is (A) and (E).

7. C and E

The blank refers to the relation of potential risks to children's safety from free-range parenting and the psychological advantages of it. The clue is *while skeptics contend* which is in contrast to *proponents* who *value the benefits of greater independence*. So skeptics would say that the risks exceed the advantages, so a good word for the blank is "surpass." Choice (A), *censure*, which means to reprimand or rebuke, is not a good match. Eliminate it. Choice (B), *balance*, is not a good match. Eliminate it. Choice (C), *outweigh*, is a good match. Keep this choice. Choice (D), *substantiate*, is not a good match. Eliminate it. Choice (E), *eclipse*, is a good match. Keep this choice. Choice (F), *reciprocate*, is not a good match. Eliminate it. The correct answer is (C) and (E).

8. A and B

The blank describes the cane toad. The clue is *the cane toad has no natural predators* and *in a way that was unforeseen*. Since it has no natural predators, the assumption is that it increased in number. So, a good word for the blank is "propagate." Choice (A), *proliferate*, which means to grow or produce, is a good match. Keep this choice. Choice (B), *dominate*, does create a sentence with a similar meaning. If the cane toad has no natural predators, it makes sense that it would predominate in a way that was unforeseen. Keep this choice. Choice (C), *abate*, which means to diminish, is opposite in meaning of the word for the blank. Eliminate it. Choice (D), *insinuate*, which means to suggest or hint slyly, is not a good match. Eliminate it. Choice (E), *eradicate*, and Choice (F), *ravage*, are not good matches. Eliminate these choices. The correct answer is (A) and (B).

9. B and D

The blank refers to the type of writing in contemporary fiction. The clue is *spontaneous, uncensored expression, a hallmark of writers such as Woolf and Kerouac*. Since they are not contemporary writers, the sentence is drawing a contrast. The sentence goes on to say that contemporary fiction has *polished prose, edited and re-edited to quotable perfection*. So the type of writing that was a hallmark of Woolf and Kerouac has been replaced with this contemporary form that is *not spontaneous and uncensored*. So a good word for the blank is "replaced." Choice (A), *mirrored*, is opposite in meaning of the word for the blank. Eliminate it. Choice (B), *supplanted*, is a good match for "replaced." Keep this choice. Choice (C), *distinguished*, is opposite in meaning of the word for the blank. Eliminate it. Choice (D), *displaced*, is a good match. Keep this choice. Choice (E), *reflected*, and choice (F), *memorialized*, are not good matches. Eliminate these choices. The correct answer is (B) and (D).

10. B and F

The blank refers to the team and what can happen to it at this critical juncture. The clue is *to forestall certain failure, immediate corrective action is paramount*. The semi-colon transition indicates that the first half of the sentence agrees with the second half. The second half of the sentence states, *no subsequent tasks possess a whit of worth should the team...* So, a good word for the blank is “fail.” Choice (A), *prevail*, is opposite in meaning of “fail.” Eliminate it. Choice (B), *founder*, is a good match for “fail.” Keep this choice. Choice (C), *unite*, is not a good match. Eliminate it. Choice (D), *triumph*, is opposite in meaning of the word for the blank. Eliminate it. Choice (E), *orchestrate*, is not a good match. Eliminate it. Choice (F), *falter*, is a good match for “fail.” Keep this choice. The correct answer is (B) and (F).

Text Completion Drill (page 228)

1. D

The blank refers to the viewer of photorealistic objects onscreen. The clue is *one most bound to impress audiences given that the precision with which it is practiced is immediately discernible to even the most unsophisticated*. So a good word for the blank is “average viewer.” Choice (A), *artist*, is not a good match. Eliminate it. Choice (B), *lackey*, which means underling, is not a good match. Eliminate it. Choice (C), *virtuoso*, which means a person who has special knowledge or skill in a field, is opposite in meaning of the word for the blank. Eliminate it. Choice (D), *layperson*, is a good match for “average viewer.” Keep this choice. Choice (E), *critic*, is not a good match. Eliminate it. The correct answer is (D).

2. E

The blank refers to the professor’s public position. The first clue is the *professor often loudly criticized the greed that attended commercial enterprise*. The contrasting transition word, *while*, indicates that there is a difference between the professor’s public and private positions. The sentence goes on to say that *his private negotiations with the university that employed him betrayed the ... of his public position for he demanded a large salary increase and perquisites that might rival those of the prerevolutionary French nobility*. So a good word for the blank is “righteousness.” Choice (A), *avarice*, which means greed, is not a good match. Eliminate it. Choice (B), *erudition*, which means scholarship or learning, is not a good match. Eliminate it. Choice (C), *hypocrisy*, is tempting because the professor is hypocritical in that his private position is opposite of what he professes publicly. However, the blank only describes his public position so *hypocrisy* is not a good match. Choice (D), *forthrightness*, which means frank and direct, is not a good match. Eliminate it. Choice (E), *rectitude*, which means correctness or principled, is a good match for “righteousness.” Keep this choice. The correct answer is (E).

3. A

The blank describes Pablo Picasso. The clue is *broke from conventional painting styles and forged his own avant-garde idiom*. So, a good word for the blank is “nonconformist.” Choice (A), *iconoclast*, which means a dissenter, is a good match for “nonconformist.” Keep this choice. Choice (B), *patriarch*, is not a good match. Eliminate it. Choice (C), *conformist*, is opposite in meaning of the word for the blank. Eliminate it. Choice (D), *aesthete*, which means a person who has a great appreciation for art, nature, and beauty, is not a good match. Eliminate it. Choice (E), *curmudgeon*, which means a cantankerous person, is not a good match. Eliminate it. The correct answer is (A).

4. E

The blank refers to John Mueller’s conclusion about war. The clue is *a conclusion that is perhaps more rooted in ... than scholarship*. So the word for the blank must be *opposite* in meaning of *scholarship*. Thus, a good word for the blank is “fantasy.” Choice (A), *dissension*, which means disagreement or discord, is not a good match. Eliminate it. Choice (B), *pragmatism*, which means practicality, is not a good match. Eliminate it. Choice (C), *vanity*, is not a good match. Eliminate it. Choice (D), *belligerence*, which means aggressiveness or combativeness, is not a good match. Eliminate it. Choice (E), *utopianism*, is a good match for “fantasy.” Keep this choice. The correct answer is (E).

5. B and D

This is a two blank text completion question, so begin by working with the easier blank. The first blank seems to be the better starting point. The blank is a noun that describes what the lawyer is known for. The colon transition indicates that the first half of the sentence agrees with the second half. The clue is *she argued her point with all due vigor*. So a good word for the first blank is “argumentativeness.” Choice (A), *lethargy*, which means listlessness or sluggishness, is not a good match. Eliminate it. Choice (B), *pugnacity*, which means a natural disposition to being quarrelsome or belligerent, is a good match. Keep this choice. Choice (C), *prescience*, which means foresight, is not a good match. Eliminate it. Now work with the second blank which is also a noun that describes what the lawyer is known for. The clue is *knew when to back down*. Although she argued her point, she was able to compromise. So a good word for the second blank is “appeasement.” Choice (D), *conciliation*, which means goodwill, is a good match. Keep this choice. Choice (E), *repudiation*, which means rejection with disapproval or condemnation, is opposite in meaning of the word for the blank. Eliminate it. Choice (F), *cacophony*, which means a harsh sound, is not a good match. Eliminate it. The correct answer is (B) and (D).

6. A and F

This is a two blank text completion question, so begin by working with the easier blank. The second blank seems to be the better starting point. It is a plural noun that describes what was not meticulously analyzed in the study. The clue is *flawed because, they argued, it clearly lacked the meticulous analysis of possible...that could have unexpectedly contributed.* So, a good word for the second blank is “irregularities.” Choice (D), *regularities*, is opposite in meaning of the word for the blank. Eliminate it. Choice (E), *anachronisms*, which means things that are out of place in time, is not a good match because there is no indication that these irregularities involved a time element. Eliminate it. Choice (F), *anomalies*, which means abnormalities or inconsistencies, is a good match. Keep this choice. Now use the completed second blank to assist in answering the first blank which is a verb that describes the study in relation to many in the field. The clue is *flawed because, they argued, it clearly lacked*. So they came to a conclusion about the study. A good word for the first blank is then “evaluated.” Choice (A) *appraised*, is a good match. So keep this choice. Choice (B), *debated*, is not a good match. The blank is describing the conclusion reached by those in field about the rigor of the study. It is not about debating the quality of the study. Eliminate it. Choice (C), *entertained*, is not a good match. Eliminate it. The correct answer is (A) and (F).

7. A and F

This is a two blank text completion question, so begin by working with the easier blank. The first blank seems to be the better starting point. The blank is a noun that describes what the drafters considered the system of checks and balances. The clue is *the drafters of the US Constitution considered a system of checks and balances a necessary...against.* So a good word for the first blank is “safeguard.” Choice (A), *bulwark*, which means a defensive fortification, is a good match. Keep this choice. Choice (B), *legality*, is not a good match. Eliminate it. Choice (C), *compromise*, is not a good match. Eliminate it. Now use the completed first blank to assist in answering the second blank which is a noun that describes what a republican form of government is subjected to. The clue is *a fickle electorate*. So a good word for the blank is “fickleness.” Choice (D), *enumeration*, which means to count or name one by one, is not a good match. Eliminate it. Choice (E), *demagoguery*, which means a manipulative approach that is often associated with dictators and sleazy politicians, is not a good match. Eliminate it. Choice (F), *spasms*, is a good match for “fickleness.” Keep this choice. The correct answer is (A) and (F).

8. C and E

This is a two blank text completion question, so begin by working with the easier blank. The first blank seems to be the better starting point. It a plural noun that describes individuals who challenged the skilled debater. The clue is *though they disagreed with his arguments*. So a good word for the first blank is “opponents.” Choice (A), *advocates*, and Choice (B), *proponents*, are both opposite in meaning of the word for the blank. Eliminate these choices. Choice (C), *dissenters*, which means objectors, is a good match for “opponents.” Keep this choice. Now use the completed first blank to assist in answering the second blank which is a verb that describes the outcome for the opponents who challenged the skilled debater. The clue is *they were unable to articulate their opinions as effectively as he could and invariably*. That along with the description in the beginning of the sentence, *dared to challenge the skilled debater*, indicates that a good word for the second blank is “failed.” Choice (D), *triumphed*, is opposite in meaning of the word for the blank. Eliminate it. Choice (E), *were vanquished*, which means overpowered or defeated, is a good match. Keep this choice. Choice (F), *were amplified*, which means increased, is also opposite in meaning of the word for the blank. Eliminate it. The correct answer is (C) and (E).

9. B,E, I

This is a three blank text completion question, so begin by working with the easiest blank. The second blank seems to be the best starting point. It is a noun that describes the level of effective mobilization. The clue is *there are myriad organizations that need assistance and many more residents who would like to engage in volunteer work*. The contrasting transition word, *but*, indicates that the word for the blank is opposite in meaning of the clue, so a good word for the blank is “lack.” Choice (D), *plethora*, which means an excessive amount, is opposite in meaning of “lack.” Eliminate it. Choice (E), *paucity*, which means scarcity, is a good match. Keep this choice. Choice (F), *synergy*, which means cooperative interaction, is not a good match. Eliminate it. Now that the second blank has been answered, it makes sense to work on the first blank since the answer to the second blank is part of the clue for the first blank. The first blank is a noun that describes what occurs within communities. The clue is *there are myriad organizations that need assistance and many more residents who would like to engage in volunteer work but there exists a [paucity] of effective mobilization*. So there is a disconnection. The colon transition before the clue indicates that the first half of the sentence agrees with the second half. The word *unfortunate* before the blank indicates that what is occurring is not positive, so “disconnection” is a good word for the first blank. Choice (A), *boon*, is not a good match. Eliminate it. Choice (B), *disjunction*, which means separation, is a good match. Keep this choice. Choice (C), *concurrence*, which means agreement, is opposite in meaning of the word for the blank. Eliminate it. Now, use the completed first and second blanks to assist in answering the third blank which is a verb that describes what community agencies are able to do with their local humanitarian resources. The clue is *non-profits are often unable to successfully articulate their needs and use the available help as productively as possible. Those community agencies with full-time volunteer coordinators, training programs, and clear delegations of tasks are best able to adequately...* So, a good word for the third blank is “use.” Choice (G), *inundate*, which means to overwhelm, is not a good match. Eliminate it. Choice (H), *impede*, which means to hinder, is not a good match. Eliminate it. Choice (I), *utilize*, is a good match. Keep this choice. The correct answer is (B), (E), (I).

10. B,F,G

This is a three blank text completion question, so begin by working with the easiest blank. The third blank seems to be the best starting point. It is a noun that describes the building as the final product. The clue is *certainly architects should take much of the credit for the form of a unique building*. The contrasting transition word, *but*, indicates that the word for the blank is opposite in meaning of the clue. The next sentence elaborates on this point: *the architect relies heavily upon façade consultants, engineers, and skilled builders, while the form of the building may depend, in addition, upon zoning regulations, cost, and market demands*. Thus, the final product is the result of numerous individuals so it is hardly a singular effort. A good phrase for the third blank is then, “singular effort.” Choice (G), *virtuoso performance*, which means a person who performs skillfully, is a good match. Keep this choice. Choice (H), *collaborative effort*, is opposite in meaning of the phrase for the blank. Eliminate it. Choice (I), *physical triumph*, is not a good match. Eliminate it. Now use the completed third blank to assist in answering the first blank. The first blank describes the public’s understanding of the architect’s role. The clue for the first blank is *the image of the architect as the lonely artist drawing three-dimensional forms*. The third blank clarified the apparent misconception about the architect’s role. Therefore, that misconception was key to the public’s understanding. Use “key” as the word for the first blank. Choice (A) *at odds with*, is opposite in meaning of the word for the blank. Eliminate it. Choice (B), *central to*, is a good match. Keep this choice. Choice (C), *irrelevant to*, is not a good match. Eliminate it. Now use the completed first and third blanks to assist in answering the second blank which describes the artistic vision of buildings as it relates to the architect. The clue is *as a result, buildings are viewed as the singular creations*. The *result* references the previous sentence that mentions *the image of the architect as the lonely artist...[central] to the public’s understanding of the architect’s role*. So, the public views buildings as an artistic vision emanating from the architect. Use “emanating from” as the phrase for the blank. Choice (D), *tangentially related to*, is not a good match. It’s more than tangentially related. Eliminate this choice. Choice (E), *but an afterthought to*, is not a good match. Eliminate it. Choice (F), *justifiably embodied by*, is a good match. Keep this choice. The correct answer is (B), (F), (G).

Lesson 6 Math

Probability Drill (page 242)

1. 0.4

This question involves probability which is $\frac{\# \text{ of possible outcomes that satisfy condition}}{\# \text{ of total possible outcomes}}$

or $\frac{\text{want}}{\text{total}}$. If one third of the 75 colored tiles are blue, then there are $\frac{1}{3} \times 75 = 25$ blue

tiles. The question states that 40% of the remaining tiles are green. First, determine the number of remaining tiles which is $75 - 25 = 50$. If 40% are green, then there are

$\frac{40}{100} \times 50 = 20$ green tiles. If all other tiles are white, then there are $50 - 20 = 30$ white

tiles. The probability of a white tile is $\frac{\text{want}}{\text{total}} = \frac{\text{white}}{\text{total}} = \frac{30}{75}$. If a numeric entry question

asks for the answer expressed as a fraction, then there are two numeric entry boxes – one for the numerator and one for the denominator. Since there is only one box for this question, convert the fraction to a decimal. $\frac{30}{75} = 0.4$. The correct answer is 0.4.

2. B

Since both quantities involve actual numbers and no variables, eliminate answer choice (D). Quantity B is the probability that *at least* two of the people roll the same number which means calculating the probability that exactly 2 people roll the same number, or exactly 3 people roll the same number, or exactly 4 people roll the same number.

Expressed as an equation, it is $P(2 \text{ or more same}) = P(2 \text{ same}) + P(3 \text{ same}) + P(4 \text{ same})$.

That's not an easy task since all the possible situations must be considered. For

example, calculating the probability that exactly 2 people roll the same number means considering that it could be the 1st person and the 2nd person, or the 2nd and 3rd, or the 3rd and 4th, etc. It's easier to find the probability of the situation that *doesn't* match the condition which is that *none* of the people roll the same number. The formula is $P(A) = 1 - P(\text{not } A)$ or in this case, $P(2 \text{ or more same}) = 1 - P(\text{not same})$. The probability that the

2nd person does not match the first is $\frac{5}{6}$. The probability that the 3rd person does not

match the 1st or the 2nd person is $\frac{4}{6}$ and the probability that the 4th person does not

match the 1st, 2nd or 3rd person is $\frac{3}{6}$. So, $P(2 \text{ or more same}) =$

$1 - \left(\frac{5}{6} \times \frac{4}{6} \times \frac{3}{6} \right) = 1 - \frac{5}{18} = \frac{13}{18}$. Therefore, Quantity B is $\frac{13}{18}$. Since Quantity A is $\frac{2}{3} = \frac{12}{18}$,

Quantity B is greater. The correct answer is (B).

3. C

The question asks for the probability that *both* a red and a blue marble will be selected. There are 2 scenarios that meet the condition: a red marble followed by a blue marble or a blue marble followed by a red marble. Both situations must be considered. Since the Probability of A or B = Probability A + Probability B, the equation is $P(\text{both red and blue}) = P(R,B) + P(B,R)$. There are a total of 16 marbles and two are selected without replacement. Thus, the total decreases with the 2nd selection. Therefore,

$$P(R,B) + P(B,R)$$

$$= \left(\frac{4}{16} \times \frac{12}{15} \right) + \left(\frac{12}{16} \times \frac{4}{15} \right)$$

$$= \left(\frac{1}{4} \times \frac{4}{5} \right) + \left(\frac{3}{4} + \frac{4}{15} \right)$$

$$= \frac{1}{5} + \frac{1}{5} = \frac{2}{5}$$

The correct answer is (C).

Quadratics Drill (page 248)**1. B, F**

The question asks for the value of x , so it is asking for the roots of the equation.

Quadratic equations have at most 2 distinct roots, so at most 2 of the answer choices are correct. To solve the question, factor the equation $x^2 + 19x + 48 = 0$. Find two numbers that multiply to 48 and add to 19. The numbers are 3 and 16. So the factored form is $(x + 3)(x + 16) = 0$. Thus, $x + 3 = 0$, so $x = -3$ and $x + 16 = 0$, so $x = -16$. The correct answer is (B) and (F).

2. A

If one of the roots is 6, then $x = 6$. Now, Plug In $x = 6$ into the equation and solve for p . $x^2 + px - 18 = 0$ is then $6^2 + 6p - 18 = 0$. Now simplify. $36 + 6p = 18$. Thus, $6p = -18$ and $p = -3$. The correct answer is (A).

3. 12

At first glance, it might seem that this question requires a lot of tedious calculations.

Don't panic! First, rearrange the terms as follows: $[(\sqrt{7} + 2)(\sqrt{7} - 2)][(\sqrt{5} + 1)(\sqrt{5} - 1)]$

Notice that this problem has the form of the difference of squares: $(x + y)(x - y) = x^2 - y^2$ which is one of the Common Quadratics. So use that factorization to solve this question more efficiently. $[(\sqrt{7})^2 - 2^2][(\sqrt{5})^2 - 1^2] = [7 - 4][5 - 1] = 3 \times 4 = 12$. The correct answer is 12.

Functions and Patterns and Sequences Drill (page 254)

1. A

Questions with strange symbols are function questions. Simply follow the directions and substitute the numbers into the function. In this case, substitute 3 and 4 for a and b

which results in $\frac{1}{\frac{1}{3} + \frac{1}{4}} = \frac{1}{\frac{7}{12}} = \frac{12}{7}$. Quantity A is $\frac{12}{7}$ which is greater than Quantity B.

The correct answer is (A).

2. E

This question involves conventional function notation. Follow the directions. To find the value of $f(5)$, first find the value of x for which $\frac{x+14}{4} = 5$. First, clear the fraction by

multiplying both sides of the equation by 4. Thus, $x + 14 = 20$ and $x = 6$. Now, Plug In $x = 6$ into $f\left(\frac{x+14}{4}\right) = 5x^2 - 2x + 10$. The result is $f(5) = 5(6^2) - 2(6) + 10$. Now simplify.

$5 \times 36 - 12 + 10 = 180 - 2 = 178$. The correct answer is (E).

3. E

At first glance, it might seem that this question requires a lot of tedious calculations such as adding 15 terms. Don't panic! Since this is a sequence question, look for a

pattern. Start with the first term which is $a_1 = \frac{1}{1+1} - \frac{1}{1+2} = \frac{1}{2} - \frac{1}{3}$. The second term is

$a_2 = \frac{1}{2+1} - \frac{1}{2+2} = \frac{1}{3} - \frac{1}{4}$. The third term is $a_3 = \frac{1}{3+1} - \frac{1}{3+2} = \frac{1}{4} - \frac{1}{5}$. Now add the first three terms and look for a pattern.

$a_1 + a_2 + a_3 = \left(\frac{1}{2} - \frac{1}{3}\right) + \left(\frac{1}{3} - \frac{1}{4}\right) + \left(\frac{1}{4} - \frac{1}{5}\right) = \frac{1}{2} - \frac{1}{5}$. Notice that $-\frac{1}{3}$ cancels with $\frac{1}{3}$ and

$-\frac{1}{4}$ cancels with $\frac{1}{4}$. The only values that remain are $\frac{1}{2}$ (the first value from the first term) and $-\frac{1}{5}$ (the second value of the last term). That is also the pattern when all 15

terms are added; everything cancels except $\frac{1}{2}$ and the last value of the last term. So

find the value of the last term. $a_{15} = \frac{1}{15+1} - \frac{1}{15+2} = \frac{1}{16} - \frac{1}{17}$. So the sum of the first

15 terms of the sequence is $\frac{1}{2} - \frac{1}{17} = \frac{15}{34}$. The correct answer is (E).

Comprehensive Drill (page 256)

1. A,B,C,D,E,F,G

This question involves overlapping ranges. The answer is a range of values that satisfies both inequalities. To solve, combine the ranges of each inequality by using a grid to account for all the possible values. The first column is for the first variable, g . The second column is for the second variable, h , and the last column is for the operation, $g - h$. The least value for g is 0, so that goes in the first two rows of the first column and the greatest value for g is 5, so that goes in the last two rows of the first column. The second column has the least and greatest values of h in alternating rows. The final column is the difference of each combination since subtraction is the operation in the question. Here's what the completed grid looks like:

| g | h | $g - h$ |
|-----|-----|---------|
| 0 | 0 | 0 |
| 0 | 1 | -1 |
| 5 | 0 | 5 |
| 5 | 1 | 4 |

For all possible values of $g - h$, analyze the last column and choose the least value, -1 and the greatest value, 5. So the complete range of $g - h$ is $-1 \leq g - h \leq 5$. The value of $g - h$ could be any number that falls within that range. Notice that every answer choice falls within that range. Therefore, the correct answer is (A), (B), (C), (D), (E), (F), and (G).

2. C

It's easier to find the probability of the situation that *doesn't* match the condition which is that *neither* of the two cookies chosen is chocolate chip. The formula is $P(A) = 1 - P(\text{not } A)$ or in this case, $P(1 \text{ choc chip}) = 1 - P(\text{other, other})$. The probability that the 1st cookie chosen is *not* chocolate chip is $\frac{3}{4}$. The probability that the 2nd cookie chosen is *not* chocolate chip is $\frac{2}{3}$. So, $P(1 \text{ choc chip}) = 1 - \left(\frac{3}{4} \times \frac{2}{3}\right) = 1 - \frac{1}{2} = \frac{1}{2}$. The correct answer is (C).

3. D

Since there are variables in the answer choices, Plug In. Use an easy number for Jordan's age such as $j = 10$. In 2 years, Jordan is $10 + 2 = 12$. Five years ago, if Marshall was three times older than Jordan will be in two years, then Marshall was $12 \times 3 = 36$. Now, Marshall is $36 + 5 = 41$. That is the target answer, so circle it. Now, check the answer choices. Choice (A) is $\frac{10}{3} - 11 = -\frac{23}{3}$ which does not match the target, so eliminate it.

Choice (B) is $\frac{10}{3} - 5 = -\frac{5}{3}$. Eliminate it. Choice (C) is $3(10) + 5 = 35$. Eliminate it. Choice (D) is $3(10) + 11 = 41$. Keep choice (D) and check the remaining answer. Choice (E) is $10 + 7 = 17$. Eliminate it. The correct answer is (D).

4. C

First rewrite $81^m = 3^n$ using common bases. Since $81 = 3^4$, use the Power-Multiply exponent rule and substitute 3^4 for 81 in the original equation. Thus, $3^{4m} = 3^n$ and $4m = n$. Now, substitute $4m$ for n in the fraction in Quantity B which results in $\frac{m}{n} = \frac{m}{4m} = \frac{1}{4}$.

Since the two quantities are equal, the correct answer is (C). Alternately, after determining that $4m = n$, Plug In values for m and n such as $m = 2$ and $n = 8$. Thus,

$\frac{m}{n} = \frac{2}{8} = \frac{1}{4}$. The two quantities are equal, so eliminate choices (A) and (B). Now, Plug In again using FROZEN. Try Extreme numbers such as $m = 100$ and $n = 400$. Now

$\frac{m}{n} = \frac{100}{400} = \frac{1}{4}$ and the two quantities are again equal. Continue Plugging In until all the FROZEN options are exhausted. Regardless of which values are used, the quantities are always equal because n is 4 times m . The correct answer is (C).

5. D

Since the questions ask about the *percent increase*, use the percent change formula:

$\frac{\text{difference}}{\text{original}} \times 100$. From 2012 to 2014, the percent of customers who bought organic

produce increased from 12.5% to 50%. The percent increase is

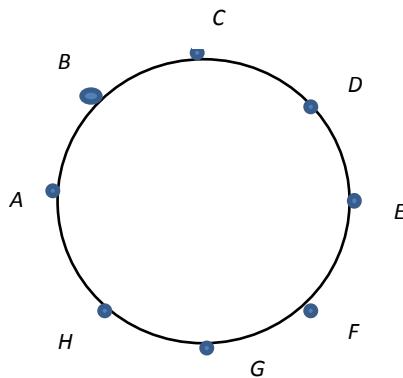
$\frac{50\% - 12.5\%}{12.5\%} \times 100 = \frac{37.5\%}{12.5\%} \times 100 = 300$. The correct answer is (E).

6. D

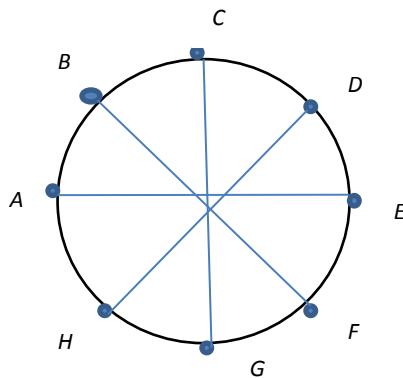
This question involves probability which is $\frac{\# \text{ of possible outcomes that satisfy condition}}{\# \text{ of total possible outcomes}}$

or $\frac{\text{want}}{\text{total}}$. The *want* is the number of *right* triangles that can be drawn and the *total* is

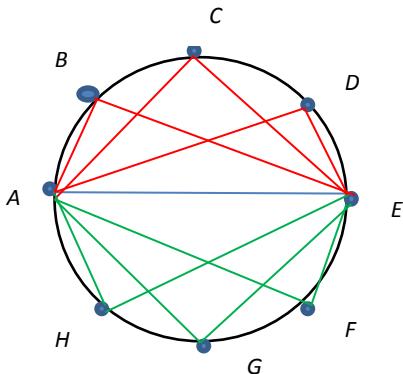
the total number of triangles that can be drawn. First draw the figure.



There are 4 distinct diameters that can be drawn using the 8 points, AE , BF , CG , and HD .



For each of those diameters, there are 6 right triangles that can be formed. For example, for diameter AE , right triangles can be formed with points, ABE , ACE , ADE , AHE , AGE , and AFE . Thus, there are a total of $6 \times 4 = 24$ right triangles that can be drawn.



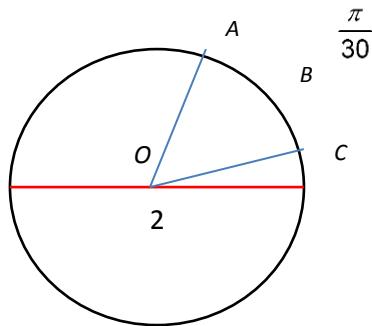
Determining the total number of triangles involves selecting 3 points (that are the vertices of each triangle) out of the 8 available points. There are 3 spots. For the 1st spot, there are 8 possible points, for the 2nd spot there are 7 possible points, and for the 3rd spot there are 6 possible points. Since the order of the points doesn't matter, this is a combination. $(a, b, c) = (c, b, a)$. Divide by the factorial of the number of items chosen from the source. The selection is $\frac{8 \times 7 \times 6}{3 \times 2 \times 1} = 56$. Therefore, the probability that the 3 points selected form a right triangle is $\frac{\text{want}}{\text{total}} = \frac{24}{56} = \frac{3}{7}$. The correct answer is (D).

7. D

This is a Quant Comp question with variables, so Plug In. First Plug In easy numbers according to the question restrictions such as $x = 6$ and $y = 3$. Quantity A is then $\frac{6}{3} = 2$. Since Quantity A is greater than Quantity B, eliminate answer choices (B) and (C). Now, Plug In again using FROZEN. Keep $x = 6$ but since the question involves inequalities which have both positive and negative solutions, try a Negative number for y such as $y = -3$. Now, Quantity A is $\frac{6}{-3} = -2$ and the two quantities are equal. Eliminate choice (A). The correct answer is (D).

8. 6

First draw the figure and label the information provided.



If O is the center of the circle, then AO and OC are radii and $\angle AOC$ is a central angle. Use the formula for the proportions in a circle, $\frac{\text{central}\angle}{360^\circ} = \frac{\text{arc}}{\text{circumference}}$, to determine the measure of $\angle AOC$. If the diameter is 2 and the formula for the circumference of a circle is $C = \pi D$, then the circumference of circle O is 2π . Plug the values for the circumference

and the length of arc ABC into the formula which results in $\frac{\text{central}\angle}{360^\circ} = \frac{\pi}{2\pi}$. Next, cross-multiply: $(2\pi)(\text{central}\angle) = (360)\left(\frac{\pi}{30}\right)$. Now, solve for the central \angle . The $\text{central}\angle = \frac{12\pi}{2\pi} = 6$ degrees. The correct answer is 6.

9. E

Since the question asks for the ratio of f to d , the goal for this system of equations is for the variable e to cancel out. So stack the equations and add them.

$$\begin{array}{rcl} 2d + e + 2f & = & 0 \\ + (3d - e - 5f = 0) \\ \hline 5d & - 3f & = 0 \end{array}$$

The variable e cancels out. Rewrite the equation as $5d = 3f$. Plug in values for d and f that fit the equation such as $d = 3$ and $f = 5$. Then the ratio of f to d is 5 to 3 which is also $\frac{5}{3}$. The correct answer is (E).

10. A,B

Since there is a variable in the answer choice, Plug In. Start with a number that makes the calculations easy. Since there is a radical, Plug In a perfect square, such as $n = 4$.

$\frac{1}{\sqrt{n}} = \frac{1}{\sqrt{4}} = \frac{1}{2}$. The operation for Choice (A) is to multiply both the numerator and

denominator by \sqrt{n} which in this case is $\sqrt{4} = 2$. The result is $\frac{1 \times 2}{2 \times 2} = \frac{2}{4} = \frac{1}{2}$ which produces an equivalent number. Keep choice (A) for now. The operation for Choice (B) is

to divide both the numerator and denominator by 9. The result is $\frac{\frac{1}{9}}{\frac{2}{9}} = \frac{1}{9} \times \frac{9}{2} = \frac{1}{2}$. It also

produces an equivalent number, so keep choice (B) for now. The operation for Choice (C) is to subtract 3 from both the numerator and denominator. $\frac{1-3}{2-3} = \frac{-2}{-1} = 2$ which is *not* an equivalent number, so eliminate choice (C). Plug In again. This time try a number that is *not* a perfect square such as $n = 5$. $\frac{1}{\sqrt{n}} = \frac{1}{\sqrt{5}}$. Choice (A) is then just rationalizing

the denominator. $\frac{1}{\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{\sqrt{5}}{5}$ which is an equivalent number. So keep choice (A).

Choice (B) is $\frac{\frac{1}{9}}{\frac{1}{\sqrt{5}}} = \frac{1}{9} \times \frac{9}{\sqrt{5}} = \frac{1}{\sqrt{5}}$ which is also an equivalent number. So keep choice

(B). Regardless of which numbers are used for n , choice (A) always produces an equivalent number because multiplying *both* the numerator and denominator by \sqrt{n} is the same as multiplying by 1. Choice (B) always produces an equivalent number because dividing *both* the numerator and denominator by 9, means that the 9's always cancel out when the numerator is multiplied by the reciprocal of the denominator. The correct answer is (A) and (B).

Lesson 6 Verbal

Reading Comprehension Practice (page 274)

1. D

The subject of the question is the passage as a whole. The task is indicated by the phrase *this passage is primarily focused on*. To answer the question, analyze the passage and determine why the author wrote it. The first sentence of the passage claims that *moderns have only his extant plays and what little reliable biographical information about the comic playwright ancient rhetoricians preserved* to understand Aristophanes' *political leanings*. In the last sentence of the passage, the author claims: *I believe that modern scholars cannot identify what Aristophanes' political leanings were*. So, the author is primarily focused on the inability to fully understand Aristophanes' political leanings. Choice (A) uses the recycled language *ancient rhetoricians* and *selected* which is discussed in the second sentence but the *reasons* for the selections of his plays is not the *primary* purpose of the passage. Eliminate it. Choice (B) uses all recycled language. It is a reversal because the primary purpose is Aristophanes' *political* leanings not his *aristocratic* leanings. Eliminate it. Choice (C) is a memory trap from the second sentence which states *when selecting examples from which to teach*. However, the *educational merits* of the plays is not the *primary* purpose of the passage. Eliminate it. Choice (D) is supported by the passage in both the first and last sentences which discuss the difficulties of identifying Aristophanes' political leanings. Keep this choice. Choice (E) uses the recycled language *comedy*, *ancient*, and *modern day*. Additionally, there is no such comparison in the passage of comedy writing in ancient times to comedy writing in modern day. Eliminate it. The correct answer is (D).

2. A

The subject of the question is *an important factor to an ancient rhetorician who selected one of Aristophanes' plays from which to teach*. The task is indicated by the phrase *the information in the passage suggests*. To answer this inference question, determine what the passage states about the subject and then evaluate the answer choices to determine which is supported by the text. The second sentence in the passage claims that *when selecting examples from which to teach, ancient rhetoricians sifted through his plays to find the most persuasive dialogue*. Choice (A) contains the phrase *mock opponents* which is supported by *persuasive dialogue* in the passage. Keep this choice. Choice (B) is a reversal. The rhetoricians wanted the *most persuasive* dialogue not dialogue considered *relatively weak*. Eliminate it. Choice (C) uses the extreme wording *advocates egalitarianism* which is not supported by the text. The passage indicates that the rhetoricians *had their own personal biases* which were *aristocratic and conservative* not egalitarian. Eliminate it. Choice (D) uses the recycled language *contemporary*. It also uses the extreme language *immensely popular* which is not supported by the text since the level of popularity among *its contemporary viewers* is not discussed. Eliminate it. Choice (E) uses the comparison words *more about character's persuasive dialogue than about political views*. There is no such comparison in the text. Eliminate it. The correct answer is (A).

3. C

The subject of the question is the argument made in the passage about *whether moderns can deduce Aristophanes' political affiliations*. The task is indicated by the phrase *most seriously weaken the argument*. To answer the question, identify the argument and then evaluate the answer choices to determine which would weaken it. The author concludes that *modern scholars cannot identify what Aristophanes' political leanings actually were*. His premise is *moderns have only his extant plays and what little reliable biographical information about the comic playwright ancient rhetoricians preserved to make any sort of conclusion*. To weaken the argument, the correct answer will show that there is sufficient information to determine Aristophanes' political affiliations. Choice (A) does not weaken the argument because the existing plays were selected by the ancient rhetoricians who *had their own personal biases* which were *aristocratic and conservative*. This provides no additional information to identify Aristophanes' political affiliations. Eliminate it. For choice (B), simply identifying which plays no longer exist offers no information about the content or Aristophanes' political affiliations. Eliminate it. Choice (C) weakens the argument. Lists of his *political actions* would enable modern scholars to identify his political leanings. Keep this choice. Choice (D) does not provide additional information to identify Aristophanes' political affiliations. Modern scholars already knew the *reasons ancient rhetoricians taught from certain plays of Aristophanes*. Eliminate it. Choice (E) does not provide additional information to identify Aristophanes' political affiliations. The author mentions in the passage that *comedies are written to entertain*. So, he surmises that Aristophanes' political humor was written for his audience. Eliminate it. The correct answer is (C).

Reading Comprehension Practice (page 276)

1. A and C

The subject of the question is the *factors considered to be most important* from the 1980s to the 1990s in the *reintegration of dolphins into the wild*. The task is identified by the phrase *according to the passage, which of the following*. To answer the question, retrieve that information from the passage. The second sentence states *from the 1980s to the 1990s, researchers focused on several aspects of its physiology, including the native intelligence of the animal....* The third sentence states *other factors believed to have major effects upon this task included the dolphin's age...and its genetics*. So, the most important factors were native intelligence, age, and genetics. Choice (A) *age of the dolphins* matches *dolphin's age* in the passage. Keep this choice. Choice (B) uses the recycled language *time spent underwater while in captivity* which is part of the discussion regarding new research and not from the 1980s to 1990s. Eliminate it. Choice (C) *mental capacity* matches *native intelligence* in the passage. Keep this choice. The correct answer is (A) and (C).

2. C

The subject of the question is *Davenport and earlier researchers' opinions about dolphins*. The task is indicated by the phrase *it can be inferred*. To answer this inference question, evaluate the answer choices and determine which is supported by the passage. Choice (A) uses the extreme language *genetics predominates*. While the passage mentions *genetics* in the third sentence as a factor believed to have *major effects* on reintegration, there is no indication that it *predominates*. Eliminate it. Choice (B) is a reversal. The passage states in the last sentence *by engaging the dolphins below the surface and eliminating the practice of trainers standing at the surface of the pool, he was able to facilitate the reintroduction*. Since choice (B) states the opposite, eliminate it. Choice (C) is supported by the last sentence of the passage that states *by engaging the dolphins below the surface ... he was able to facilitate the reintroduction of captive dolphins into the oceans*. So, clearly dolphins are *adaptable* creatures whose behavior can be *changed*. Keep this choice. The correct answer is (A) and (C).

3. B

The subject of the question is the last sentence of the passage. The task is indicated by the phrase *serves which of the following roles*. To answer the question, determine the purpose of the last sentence – why the author included it. The last sentence is a discussion of Davenport's discoveries. The sentence before the last states that *Davenport discovered through close observation that wild dolphins spend eighty percent of their time underwater, while captive dolphins spend eighty percent of their time at the surface*. Thus, the last sentence supports his discovery of an obstacle to reintegration and demonstrates by *eliminating* the obstacle that *he was able to facilitate the reintroduction of captive dolphins into the oceans*. Choice (A) makes a false comparison. The last sentence does not *compare the discoveries of Davenport to that of earlier researchers*. The last sentence supports his discovery. Eliminate this choice. Choice (B) matches the purpose of the last sentence. It *supports his position*. Keep this choice. Choice (C) is a reversal. The last sentence states that *he was able to facilitate the reintroduction* not as the answer states to *impede* it. Eliminate this choice. The correct answer is (B).

Reading Comprehension Practice (page 278)

1. C

The subject of the question is *Charles Mackay's study of tulip mania*. The task is indicated by the phrase *the author would agree with which of the following*. To answer the question, analyze the passage and determine the author's position regarding the subject. In the last sentence of the first paragraph, the author states, *with a nod to Charles Mackay's landmark study on the topic, Sendry repeats the well-known anecdote...* So, the author considers Mackay's study a *landmark*. Choice (A) uses the extreme wording *very familiar* and *most*. There is no comparison in the passage of Mackay's *familiarity* with Sundry's sources. Eliminate it. Choice (B) uses the extreme wording *superior*. There is no comparison in the passage of the *superiority* of Sundry's analysis to any other. Eliminate it. Choice (C), *foundational study* matches *landmark study* in the passage. Keep this choice. The correct answer is (C).

2. Such a contrarian view will...or the very nature of the event itself.

The subject of the question is *a projection about the eventual outcome of Sendry's study*. The task is indicated by the phrase, *select the sentence*. To answer the question, identify the sentence in the passage that provides that projection. Label each sentence as a letter and evaluate them one at a time. The first sentence mentions the central question of Sendry's study. Since there is no projection of its outcome, eliminate it. The second sentence mentions the evidence used in the study. Since there is no projection of the study's outcome, eliminate it. The third sentence mentions the anecdote that Sendry repeats. Since there is no projection of the study's outcome, eliminate it. The first sentence of the second paragraph discusses what Sendry's study illustrates. Since there is no projection of the study's outcome, eliminate it. The last sentence of the second paragraph mentions what Sendry's contrarian view will lead to. Therefore, it does provide a projection about the eventual outcome of Sendry's study. The correct answer is the last sentence of the passage: *Such a contrarian view will naturally lead many to wonder whether he is questioning the reasons for the event, or the very nature of the event itself.*

3. B

The subject of the question is the passage as a whole. The task is indicated by the phrase *the author is primarily concerned with*. To answer the question, evaluate the passage and determine the reason the author wrote it. The first sentence of the passage states *in a recent study, Ernest Sendry announces that he will examine the central question regarding the Dutch tulip mania of 1637: why did it happen?* The remainder of the first paragraph mentions Sendry's evidence and what he notes. The second paragraph mentions what Sendry's study illustrates. That it *nullifies previous economists' characterization of the event* which the author considers a *contrarian view*. So, the author is primarily concerned with presenting Sendry's *contrarian view*. Choice (A) is a reversal. The author is not *summarizing a well-known set of opinions*. He is evaluating *one opinion* – Sendry's contrarian view. Eliminate this choice. Choice (B), *analyzing a counterargument*, matches presenting a *contrarian view* from the passage. Keep this choice. Choice (C) does not match the author's primary purpose. He is not concerned with another author's *purpose for writing a text*. He is concerned with another author's *contrarian view*. Eliminate this choice. Choice (D) is a reversal. The author is not *synthesizing several opinions*. He is evaluating *one opinion* – Sendry's contrarian view. Eliminate it. Choice (E) does not match the author's primary purpose. He is not hypothesizing about the *reasons behind a historical event*. He is evaluating *another author's hypothesis* about the reasons behind a historical event. Eliminate this choice. The correct answer is (B).

Lesson 7 Math

Arrangements & Combinations Drill (page 296)

1. C

Since the question references the number of *different arrangements*, order matters. Displaying a baseball trophy in the first spot and a basketball trophy in the second spot isn't the same arrangement as displaying a basketball trophy in the first spot and a baseball trophy in the second. $(a, b, c) \neq (c, b, a)$. Thus, order matters. The question involves selecting multiple items from one source (trophies). Since there are 5 trophies, there are 5 spots. For the 1st spot on the mantel, there are 5 possible trophies that can fill it. For the 2nd spot there are 4 trophies (since one trophy was used for the 1st spot), for the 3rd spot there are 3 trophies, for the 4th spot there are 2 trophies, and for the 5th spot there is 1 trophy. Now, calculate the product to find the total arrangements: $5 \times 4 \times 3 \times 2 \times 1 = 120$ different arrangements. The correct answer is (C).

2. C

This question involves selecting multiple items from one source (fillings). There are 3 spots. For the 1st spot there are 6 possible fillings, for the 2nd spot there are 5 fillings, and for the 3rd spot there are 4 fillings. Since the order of the fillings doesn't matter, this is a combination question. An omelet with cheese, mushroom, and bacon is the same as an omelet with bacon, mushroom and cheese. $(a, b, c) = (c, b, a)$. Since order doesn't matter, divide by the factorial of the number of items chosen from the source.

$$\frac{6 \times 5 \times 4}{3 \times 2 \times 1} = 20 \text{ different omelets. The correct answer is (C).}$$

3. $\frac{63}{125}$

This question involves probability: $\frac{\# \text{ of possible outcomes that satisfy condition}}{\# \text{ of total possible outcomes}} = \frac{\text{want}}{\text{total}}$.

If there are 10 digits (0 thru 9), then there are 10 total possible outcomes for each of the 4 digits in the PIN. So the total number of possible PINs is $10 \times 10 \times 10 \times 10$. Determining the number of PINs that satisfy the condition in the question is the same as calculating the number of *different arrangements*. Since there are no repeated digits, order matters. It involves selecting multiple items from one source (digits) which is $10 \times 9 \times 8 \times 7$.

7. Thus, $\frac{\text{want}}{\text{total}} = \frac{10 \times 9 \times 8 \times 7}{10 \times 10 \times 10 \times 10} = \frac{63}{125}$. The correct answer is $\frac{63}{125}$.

4. C

Since there are no variables in this Quant Comp question, eliminate choice (D). This question involves selecting multiple items from one source (toppings). Quantity A is the number of different ways to order a sundae with 2 toppings. There are 2 spots. For the 1st spot, there are 7 possible toppings and for the 2nd spot, there are 6 possible toppings. Since the order of the toppings doesn't matter, this is a combination. Divide by the

factorial of the number of items chosen from the source. $\frac{7 \times 6}{2 \times 1} = 21$. So Quantity A is

21. For Quantity B, since there are 5 toppings, there are 5 spots. Again, order doesn't matter. The number of different ways to order a sundae with 5 toppings is

$\frac{7 \times 6 \times 5 \times 4 \times 3}{5 \times 4 \times 3 \times 2 \times 1} = 21$. Since the two quantities are equal, the correct answer is (C).

Number Theory Drill (page 304)

1. D

This question is testing the rules of divisibility. In order for m to be an integer, $91n$ must divide evenly into the numerator (otherwise, m would be a fraction). Therefore, all the factors of 91 and n must be factors of the numerator. To solve, use prime factorization. Start by finding the prime factors of 91. The prime factorization of $91 = 7 \times 13$. Notice that all the numbers in the numerator are prime numbers except for 8. The prime factorization of $8 = 2 \times 2 \times 2$. Therefore, the fraction can be rewritten as

$\frac{2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 7 \times 13 \times 17}{7 \times 13 \times n}$. Now cancel the common factors (7 and 13). The result:

$\frac{2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 17}{n}$. Now check the answer choices to determine which is a factor of

the numerator. The prime factorization of choice (A) is $14 = 2 \times 7$. Since 7 isn't in the numerator, 14 isn't a factor and cannot be the value of n . Eliminate choice (A). The prime factorization of choice (B) is $21 = 3 \times 7$. Again, since 7 isn't in the numerator, 21 isn't a factor and cannot be the value of n . Eliminate it. The prime factorization of choice (C) is $38 = 2 \times 19$. Since 19 isn't in the numerator, 38 isn't a factor and cannot be the value of n . Eliminate it. The prime factorization of choice (D) is $68 = 2 \times 2 \times 17$. All of its prime factors are factors of the numerator. Therefore, 68 could be the value of n . Keep choice (D) and check the last answer. The prime factorization of choice (E) is $96 = 2 \times 2 \times 2 \times 2 \times 3$. Since it has one more 2 than the numerator, 96 isn't a factor and cannot be the value of n . Eliminate this choice. The correct answer is (D).

2. C

In order for $\frac{15!}{3^m}$ to be an integer, 3^m must divide evenly into the numerator. Essentially,

the question is asking how many 3's are in $15!$? Since $15!$ is the product of all the positive integers less than or equal to 15, factor $15!$ to determine which factors are multiples of 3.

$15! = 15 \times 14 \times 13 \times 12 \times 11 \times 10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$. Of those factors, 15 (3×5), 12 (3×4), 9 (3×3), 6 (3×2) and 3 (3×1) are multiples of 3. That's a total of six 3's (there are two 3's in 9). So the greatest possible value of m is 6 since 3^6 divides evenly into $15!$. The correct answer is (C).

3. B,C

Since this is a *must be* question, Plug In more than once. The remainder is the left-over integer after division. If $n = 2$, then $\frac{2^n}{3} = \frac{2^2}{3} = \frac{4}{3}$ and the remainder is 1. So $n = 2$ satisfies

the condition in the question. Now, Plug In $n = 2$ in the statements in the answer choices. Choice (A) is $2^2 + 1 = 4 + 1 = 5$. Since 5 is *not* a multiple of 3, choice (A) is not true. Eliminate it. Choice (B) is $3^2 = (-3)^2$. Since $9 = 9$, the statement is true, so keep choice (B) for now. Choice (C) is $\sqrt{2^2} = \sqrt{4} = 2$. Since 2 is an integer, the statement is true, so keep choice (C) for now. Plug In again. n cannot be 3 because it doesn't satisfy the condition in the question since $\frac{2^3}{3} = \frac{8}{3}$ which has a remainder of 2 not 1. So try

$n = 4$. $\frac{2^4}{3} = \frac{16}{3}$ and the remainder is 1. So $n = 4$ satisfies the condition in the question.

Choice (B) is now $3^4 = (-3)^4$. Since $81 = 81$, the statement is true again. So, keep choice (B). Choice (C) is now $\sqrt{2^4} = \sqrt{16} = 4$. Since 4 is an integer, the statement is true again. So, keep choice (C). Notice that n must be an even number since odd numbers don't satisfy the condition in the question. Thus, the statement in choice (B) is always true because a negative number raised to an even power is positive. The statement in choice (C) is always true because 2 raised to an even power results in a perfect square, the square root of which is always an integer. The correct answer is (B) and (C).

Lesson 7 Verbal

Arguments Drill (page 322)

1. E

This is a resolve/explain question as evidenced by the phrase *explains the situation*. Begin by determining the conflict. The conflict is that the ancient Hrugians used *water power* in their *border towns* for various purposes. Yet, they continued to use *manual labor* for the same functions in their *capital* city, Avallone. The credited response will explain how both statements can be true at the same time. Choice (A) is one sided. It explains why water power is used in the border towns but not why manual labor is used in the capital. Eliminate it. Choice (B) is out of scope. From whom the Hrugians *learned* water power does not explain how both statements can be true. Eliminate it. Choice (C) makes the conflict worse. If water power is cheaper than manual labor, why isn't it used in the capital? Eliminate it. Choice (D) is out of scope. Stronger *security* does not resolve the water power issue. Choice (E) shows how both statements can be true. If there was no major source of water in Avallone, then it could not use water power and had to continue to use manual labor. The correct answer is (E).

2. C

This is a resolve/explain question as evidenced by the phrase *resolve the discrepancy*. Begin by determining the conflict. The conflict is that there is an *increase* in A-One Miles in 2013 which is the product of the number of paying passengers and the total number of miles traveled by all Highway buses. At the same time, there was a *decrease* in the number of paying passengers per bus trip and in the number of bus trips made. The credited response will show how both statements can be true at the same time. Choice (A) is out of scope because the argument does not pertain to the number of *canceled* trips. Eliminate it. Choice (B) is also out of scope because the argument does not pertain to the number of bus riders who *ride for free*. The argument is concerned with *paying passengers*. Eliminate this choice. Choice (C) is one sided. It doesn't explain why A-One Miles increased. Eliminate it. Choice (D) demonstrates how both statements can be true. If the average length of a bus trip increased, that explains the increase in A-One Miles which is comprised of the total number of miles traveled by all busses. It also explains the decrease in the number of paying passengers per trip and in the number of bus trips made because there are fewer trips but they last longer. Keep this choice. Choice (E) does not resolve the discrepancy. It is unclear how a 20% increase in fares between large cities explains an increase in A-One Miles. Eliminate this choice. The correct answer is (D).

3. C

This is a resolve/explain question as evidenced by the phrase *an explanation of the apparent discrepancy*. Begin by determining the conflict. The conflict is that to *save energy*, many people keep their electric freezers half-empty at all times only using them to store pre-frozen foods. Yet, freezers that are half-empty usually consume *more energy* than they would if they were kept fully stocked. The credited response will show how both statements can be true at the same time. Choice (A) is out of scope because the size of the freezer is irrelevant. Eliminate it. Choice (B) contradicts one of the facts in the argument. The argument states that freezers that are half-empty usually consumer more energy. If choice (B) were true, the half-empty freezer would use less energy. Eliminate this choice. Choice (C) demonstrates how both statements can be true. The people assume that the more food that they have in their freezers, the more energy it must use to keep the food frozen. Employing their reasoning, an empty freezer should use the least energy while a fully stocked freezer uses the most. However, as choice (C) mentions, it takes more energy to keep the volume of air in the freezer at a certain temperature than it does an identical volume of frozen food, i.e. a fully stocked freezer. Keep this choice. Choice (D) is out of scope. The argument is not about opening and closing the freezer door. Eliminate it. Choice (E) does not resolve the discrepancy. It only pertains to the initial freezing process and the argument is about average energy use over extended time. Eliminate it. The correct answer is (C).

Lesson 8 Math

Full Section Math Drill One (page 328)

1. B

Since there are no variables in this Quant Comp question, eliminate answer choice (D).

Quantity B involves negative exponents. The rule for negative exponents is $x^{-n} = \frac{1}{x^n}$.

Therefore, Quantity B can be rewritten as $\frac{5^{-1}}{6^{-1}} = \frac{\frac{1}{5}}{\frac{1}{6}} = \frac{1}{5} \times \frac{6}{1} = \frac{6}{5}$. Since Quantity B is greater than Quantity A, the correct answer is (B).

2. D

This is a Quant Comp question with variables, so Plug In. First, Plug In an easy number according to the question restrictions such as $x = \frac{1}{2}$. Quantity A is $\left(\frac{1}{2}\right)^3 + 2 = 2\frac{1}{8}$.

Quantity B is $\left(\frac{1}{2}\right)^4 + 2 = 2\frac{1}{16}$. Since Quantity A is greater, eliminate choices (B) and (C).

Now, Plug In again using FROZEN. Try a Negative number such as $x = -\frac{1}{2}$. Quantity A is

then $\left(-\frac{1}{2}\right)^3 + 2 = -\frac{1}{8} + 2 = \frac{15}{8}$. Quantity B is then $\left(-\frac{1}{2}\right)^4 + 2 = \frac{1}{16} + 2 = 2\frac{1}{16}$. Now,

Quantity B is greater. Eliminate choice (A). The correct answer is (D).

3. B

This is a Quant Comp question with variables, so Plug In. First, Plug In an easy number according to the question restrictions such as $x = 10$. Quantity A is then $0.2\%(10) = 0.02$.

Quantity B is $\frac{1}{5} \times 10 = 2$. Since Quantity B is greater, eliminate choices (A) and (C). Now,

Plug In again using FROZEN. Try an Extreme number such as $x = 100$. Quantity A is now

$0.2\%(100) = 0.2$. Quantity B is then $\frac{1}{5} \times 100 = 20$. Quantity B is greater again. Continue

Plugging In until all the FROZEN options are exhausted. Regardless of which values are

used for x , notice that Quantity A is $0.2\% = \frac{2}{100} = \frac{2}{10} \times \frac{1}{100} = \frac{1}{500}$ which is less than $\frac{1}{5}$

in Quantity B. Therefore, Quantity B is *always* greater. The correct answer is (B).

4. D

The *median* is the middle number after the numbers have been arranged in ascending order. Since the median income is not provided, Plug In. Use an easy number such as \$100,000 for the median income of the engineers of ABC Corp. Then the median income of the engineers of XYZ Corp is $\$100,000 + \$4,500 = \$104,500$. Quantity A is the 80th percentile of the incomes of the XYZ engineers. The question does not provide any information regarding the spread of the numbers in the group of incomes. Nor does it indicate how much greater the 80th percentile of the group of incomes is compared to the median. The entire group of incomes could be \$104,000 or some other numbers. The same is true for Quantity B which is the 80th percentile of the incomes of the ABC Corp. Since the relationship cannot be determined from the information given, the correct answer is (D).

5. B

Since there are no variables in this Quant Comp question, eliminate answer choice (D). Quantity A is the average of the 60 values. Draw an Average Pie. The # of things is 60 and the *Total* is $(1)(15) + (2)(8) + (3)(6) + (4)(15) + (5)(16) = 189$. Therefore, the *Average* is $\frac{189}{60} = 3.15$ and Quantity A is 3.15. Quantity B is the median of the 60 values. The *median* is the middle number after the numbers have been arranged in ascending order. Since there is an even number of values, the median is the average of the two middle values which are the 30th and 31st values. According to the graph, the first 15 values equal 1. The 16th through the 23rd values equal 2. The 24th through 29th values equal 3. Thus, the 30th and 31st values are equal to 4. Therefore, the median of the 60 values is 4. Since Quantity B is greater than Quantity A, the correct answer is (B) .

6. A

Draw the figure and label the information provided. Quantity A is the area of right triangle MNO and Quantity B is the area of right triangle MOP . Notice that MO is the hypotenuse of both triangles. The formula for area of a triangle is $A = \frac{1}{2}bh$. Thus, the

area of triangle MNO is $\frac{(3\sqrt{13})(2\sqrt{13})}{2} = \frac{6 \times 13}{2} = 39$. Quantity A is 39. To calculate the

area of triangle MOP , the length of the height OP is needed. First find the length of the hypotenuse MO and use that value along with the base 12 (which is the other leg of the right triangle MOP) to find the length of leg OP . Since the lengths of the legs of right triangle MNO are known, use those values in the Pythagorean theorem, $a^2 + b^2 = c^2$, to find the length of MO .

$$\begin{aligned}(MN)^2 + (NO)^2 &= (MO)^2 \\(3\sqrt{13})^2 + (2\sqrt{13})^2 &= (MO)^2 \\(9 \times 13) + (4 \times 13) &= (MO)^2 \\117 + 52 &= (MO)^2 \\169 &= (MO)^2 \\\sqrt{169} &= MO = 13\end{aligned}$$

Thus, the length of MO is 13. Since the length of leg MP is 12, recognize the Pythagorean triple 5-12-13. Therefore, OP is 5. Now, calculate the area of triangle MOP . Again, the formula is $A = \frac{1}{2}bh$. Thus, $\frac{12 \times 5}{2} = \frac{60}{2} = 30$ and Quantity B is 30. Since Quantity A is greater, the correct answer is (A).

7. B.

Since there are no variables in this Quant Comp question, eliminate answer choice (D). At first glance, it might seem that this question requires a lot of tedious calculations such as adding the even integers from 4 to 200 for Quantity A and adding the odd integers from 3 to 201 for Quantity B. Don't panic. Look for a pattern.

Quantity A is $4 + 6 + 8 + 10 + \dots + 198 + 200$

Quantity B is $3 + 5 + 7 + 9 + \dots + 197 + 199 + 201$

Notice that each of the terms in Quantity A is 1 more than its paired term in Quantity B except the last term, 201 which is not paired with a term in Quantity A. If there are 100 even integers from 1 to 200, then there are 99 even integers from 4 to 200. Since each of the 99 terms in Quantity A is 1 more than its paired term in Quantity B except 201, the sum of the odd integers from 3 to 201 is $201 - 99 = 102$ greater than the sum of the even integers from 4 to 200. Therefore, Quantity B is greater. The correct answer is (B).

8. B

Since there is an unknown value (the number of cars), and the answer choices are expressed as fractions, this is a Hidden Plug In. The question stem mentions percents, so Plug In 100 for the number of cars in the U.S. If the number of cars in India is 10% of the number of cars in the U.S., then the number of cars in India is $10\% (100) = 10$. The second unknown value is the population. Plug In an easy number for the population in the U.S. such as 200. If the population of India is 400% of the population of the U.S., then the population of India is $400\%(200) = 800$. Therefore, the number of cars per

capita in India is $\frac{\text{total # of cars}}{\text{total population}} = \frac{10}{800} = \frac{1}{80}$. The number of cars per capita in the U.S.

is $\frac{\text{total # of cars}}{\text{total population}} = \frac{100}{200} = \frac{1}{2}$. The question asks, *the number of cars per capita in India is how many times the number of cars per capita in the U.S.* So, divide.

$$\frac{1}{80} = \frac{1}{80} \times \frac{2}{1} = \frac{1}{40}$$
. The correct answer is (B).

9. 6.25

Draw the figure and label the information provided. When two parallel lines are intersected by a third line, big and small angles are created. The big angles are equal and the small angles are equal. The angle with the measure of 25° is a small angle. The angle with the measure of $(4y)^\circ$ is also a small angle. If the small angles are equal, then $4y = 25$

and $y = \frac{25}{4} = 6.25$. The correct answer is 6.25.

10. D

Standard deviation describes the spread of data from the mean. If the new data set is formed by subtracting the *same* number (2) from *each* number in data set *T*, then the mean of the numbers in the new data set is *2 less* than the mean of the numbers in set *T*. However, the *spread* of the numbers from the mean in the new set is still the same as the spread of the numbers from the mean in set *T*. If the numbers in data set *T* have a standard deviation of 8, then the numbers in the new data set also have a standard deviation of 8. The correct answer is (D).

11. E

Since the question asks for the value of y , cross-multiply and solve for y . Thus, $7y - y^2 = 9y - 15$. Now, simplify. $-y^2 = 2y - 15$. Next, rewrite the equation in quadratic form. $y^2 + 2y - 15 = 0$. Now, factor the equation by finding two numbers that multiply to -15 and add to 2 . The numbers are -3 and 5 . The factored form is $(y - 3)(y + 5) = 0$. Thus, $y - 3 = 0$, so $y = 3$ and $y + 5 = 0$, so $y = -5$. Since 3 is not an answer choice but -5 is, the correct answer is (E). Alternately, solve by Plugging In The Answers (PITA).

12. C

Since there is an unknown value (total number of calories) this is a Hidden Plug In. The question stem mentions percents, so Plug In 100 for the number of calories that Fred consumed on Tuesday. If the number of calories that Fred consumed on Monday was 25% less than the number of calories that he consumed on Tuesday, then Fred consumed $100 - 25\%(100) = 100 - 25 = 75$ calories on Monday. The ratio of the number of calories Fred consumed on Tuesday to the number of calories that he consumed on Monday is 100 to 75 or 4 to 3 . The correct answer is (C).

13. B

Since there are variables in the answer choices, Plug In. Use a number for x that makes the calculations easy such as $x = 20$. If $\frac{9}{10}$ of the donuts are sold each day, then

$\frac{9}{10} \times 20 = 18$ donuts are sold each day. If the remainder are discarded, then $20 - 18 =$

2 donuts are discarded each day. The question asks how many days will it take the bakery to discard 360 donuts at that rate. It will take $\frac{360}{2} = 180$ days. That is the target

answer, so circle it. Now, check the answers. Choice (A) is $\frac{360}{20} = 18$ which does not

match the target. Eliminate it. Choice (B) is $\frac{3,600}{20} = 180$ which matches the target. Keep

choice (B) and continue checking the remaining answers. Choice (C) is $\frac{20}{400} = \frac{1}{20}$.

Eliminate it. Choice (D) is $\frac{20}{3,600} = \frac{1}{180}$. Eliminate it. Choice (E) is $400(20) = 8,000$.

Eliminate it. The correct answer is (B).

14. D

In each circle graph, the degree measure of the central angle of the sector is the percentage of 360° . The number of workers who received job training for 3 to 4 weeks in the IT industry is then $25\% (360^\circ) = 90^\circ$. The number of workers who received job training for 3 to 4 weeks in the retail industry is $20\% (360^\circ) = 72^\circ$. Since $90^\circ - 72^\circ = 18^\circ$, the degree measure of the central angle of the IT industry is 18° greater than the degree measure of the central angle of the sector representing the retail industry. The correct answer is (D).

15. B

Since the median is the middle number after the numbers have been arranged in ascending order, the median number of weeks of job training is the middle number when the weeks are listed in order from least to greatest. In this case, the median is the number at which 50% of the length of job training has been listed. The group with the least length of job training is 1 to 2 weeks which accounts for the first 35% of the weeks of job training. The next group is 3 to 4 weeks which accounts for 25% of the weeks of job training. The number at which 50% of the length of job training has been listed is in this group. Therefore, the median length is in the 3 to 4 week group. The only answer choice that falls in this group is 3. The correct answer is (B).

16. B

This question involves probability which is $\frac{\# \text{ of possible outcomes that satisfy condition}}{\# \text{ of total possible outcomes}}$

or $\frac{\text{want}}{\text{total}}$. The total is the number of workers in both the retail and IT industries who

received job training for at least 1 week. So, that is the sum of the total number of workers in both circle graphs. The total for the retail industry is 6 million and the total for the IT industry is 12 million. Therefore, the total for both industries is $6 + 12 = 18$ million. The number of workers in the IT industry who received job training for 7 to 8 weeks is 12% of 12 million which is 1,440,000. Therefore,

$$\frac{\text{want}}{\text{total}} = \frac{1,440,000}{18,000,000} = \frac{2}{25} = 0.08 . \text{ The correct answer is (B).}$$

17. D,E

This is an absolute value with an inequality. Rewrite the expression without the absolute value symbol. The solution includes two separate ranges. Thus, $|x - 2| < 4$ is $x - 2 < 4$ or $x - 2 > -4$. Solve these equations to find that $x < 6$ or $x > -2$. The answer choices that are in that range of values are -1 and 5 . The correct answer is (D) and (E).

18. E

Questions with strange symbols are functions. Simply follow the directions. Since there are variables, Plug In. The question states that a and b are negative integers so Plug In easy numbers such as $a = -2$ and $b = -1$. Now, substitute those numbers into the function for a and b and check the answer choices and determine which CANNOT be zero. Since $a \diamond b = a^2 + a^2b$, choice (A) is $(-2)^2 + (-2)^2(-1) = 4 + (-4) = 0$. Eliminate this choice. Choice (B) is $(-2 - 2)^2 + (-2 - 2)^2(-1) = 16 + (-16) = 0$. Eliminate it. Choice (C) is $(-2 + 1)^2 + (-2 + 1)^2(-1) = 1 + (-1) = 0$. Eliminate it. Choice (D) is $(-2)^2 + (-2)^2(-1 + 1) = 4 + 0 = 4$. So keep this choice for now and check the last choice. Choice (E) is $(-2)^2 + (-2)^2(-1 - 2) = 4 + (-12) = -8$. So, keep this choice and Plug In again. Try Repeats. Keep $a = -2$ but now try $b = -2$. Now choice (D) is $(-2)^2 + (-2)^2(-2 + 1) = 4 + (-4) = 0$. Eliminate it. To verify, choice (E) is now $(-2)^2 + (-2)^2(-2 - 2) = 4 + (-16) = -12$. Since choice (E) CANNOT be zero, the correct answer is (E).

19. E

Draw line segment AC and Plug In a value for its length such as 10. Assume that the coordinates of point A are $(-5, 0)$ and the coordinates for point C are $(5, 0)$. If point B is the midpoint of line segment AC , then point B is at the origin $(0, 0)$. All points in the plane that are the same distance from point B as point B is from points A and C are a distance of 5. Mark off points that are equidistant (a distance of 5) from point B such as $(0, 5)$, $(5, 0)$, $(0, -5)$, $(-5, 0)$, etc. Notice that connecting these points forms a circle. Now check the answer choices. Since the set of all points that are the same distance from point B as point B is from points A and C is *each* point that forms the circle, choices (A) and (B) are false. Eliminate them. Since it is only the set of points that forms the circle and not *every* point in the plane, choice (C) is false. Eliminate it. A line passing through point B would contain points that are *not* the same distance from point B as point B is from points A and C . Therefore, choice (D) is false. Eliminate it. Since the set of points forms a circle, Choice (E) is true. The correct answer is (E).

20. 10

The formula for the perimeter of a rectangle is $P = 2l + 2w$. Plug in the values for the perimeter and the length of the rectangle and solve for the width. $28 = 2(8) + 2w$. Now simplify. $28 = 16 + 2w$. Thus, $12 = 2w$ and $6 = w$. Notice that the width, 6 and the length, 8 are also the legs of a right triangle. The Pythagorean triple is 6-8-10. Therefore, the length of the hypotenuse, which is also the diagonal of the rectangle, is 10. The correct answer is 10.

Lesson 8 Math

Full Section Math Drill Two (page 344)

1. A

If $x < 0$, then x is negative. Since a negative number raised to an *even* power is *positive*, regardless of the value of x , Quantity A is positive. Since a negative number raised to an *odd* power is *negative*, regardless of the value of x , Quantity B is negative. Therefore, Quantity A is greater. The correct answer is (A).

2. D

This is a Quant Comp question with variables, so Plug In. Start with easy numbers such as $x = 2$ and $y = 3$. Then Quantity A is $(2 - 3)(3 - 5) = (-1)(-2) = 2$. Quantity B is $(2 - 5)(3 - 3) = (-3)(0) = 0$. Since Quantity A is greater, eliminate answer choices (B) and (C). Now, Plug In again using FROZEN. Try Negative numbers such as $x = -2$ and $y = -3$. Now, Quantity A is $(-2 - 3)(-3 - 5) = (-5)(-8) = 40$. Quantity B is now $(-2 - 5)(-3 - 3) = (-7)(-6) = 42$. Since Quantity B is greater, eliminate choice (A). The correct answer is (D).

3. B

Since there are no variables in this Quant Comp question, eliminate answer choice (D). In Quantity A, $0.\overline{4}$ represents a decimal in which 4 is repeated without end. So, it is $0.4444444\dots$. Thus, $1.0 - 0.44444\dots = 0.5555555\dots$. Quantity A is clearly less than 0.6. Since Quantity B is greater, the correct answer is (B).

4. A

Since the cost of the pies is unknown, Plug In. Use an easy value for the cost of the apple pie such as \$2.00. If the cherry pie is \$0.25 less than three times the cost of the apple pie, then the cherry pie is $(2 \times 3) - 0.25 = 6 - 0.25 = \5.75 . The cost to bake 200 cherry pies and 200 apple pies is then $(200)(5.75) + (2)(200) = 1,150 + 400 = \$1,550$. So, Quantity A is \$1,550. The cost to bake 250 cherry pies is $(250)(5.75) = \$1,437.50$. So, Quantity B is \$1,437.50. Since Quantity A is greater, eliminate answer choices (B) and (C). Now Plug In again using FROZEN. Try an Extreme number for the cost of an apple pie such as \$100. Then the cost of a cherry pie is $(100 \times 3) - 0.25 = 300 - 0.25 = \299.75 . Quantity A is now $(200)(299.75) + (200)(100) = 59,950 + 20,000 = \$79,950$. Quantity B is now $(250)(299.75) = 74,937.50$. Quantity A is greater again. Continue Plugging In until all the FROZEN options are exhausted. Regardless of which value is used for the cost of the apple pie, notice that both Quantity A and Quantity B include the cost to bake 200 cherry pies. Removing that from both quantities leaves the cost to bake 200 apple pies for Quantity A and the cost to bake 50 cherry pies for Quantity B. Since the cost to bake each cherry pie is \$0.25 less than three times the cost of the apple pie, it's clear that the cost to bake 200 apple pies is greater than the cost to bake 50 cherry pies. Quantity A is *always* greater. The correct answer is (A).

5. C

Since there are no variables in this Quant Comp question, eliminate answer choice (D).

Quantity B involves negative exponents. The rule for negative exponents is $x^{-n} = \frac{1}{x^n}$.

Therefore, Quantity B can be rewritten as

$$\frac{\left(\frac{1}{3}\right)^{-4} - \left(\frac{1}{3}\right)^{-3} - \left(\frac{1}{3}\right)^{-2}}{3} = \frac{3^4 - 3^3 - 3^2}{3}$$

Next, use the Divide-Subtract exponent rule:

$$\frac{3^4 - 3^3 - 3^2}{3} = 3^{4-1} - 3^{3-1} - 3^{2-1} = 3^3 - 3^2 - 3^1$$

Now, simplify: $27 - 9 - 3 = 15$. Since the

two quantities are equal, the correct answer is (C).

6. D

Since this is a Quant Comp question with variables, Plug In. Use a value for y that makes the calculations easy such as $y = 4$. Now, use an Average Pie to determine the average of list B . The *Total* is $3 + 7 + 10 + 4 = 24$ and the *# of things* is 4. Therefore the *Average* is $\frac{24}{4} = 6$. Since the average of the numbers in list A is one more than the average of the numbers in list B , the average for list A is $6 + 1 = 7$. Therefore, the *Total* for list A is the *# of things* \times *Average* which is $7 \times 5 = 35$. Since $y = 4$, $x = 35 - 24 = 11$. Quantity B is 4 which is greater than Quantity A, so eliminate answer choices (A) and (C). Now, Plug In again using FROZEN. Try Zero. If $y = 0$, then the Average of list B is $\frac{20}{4} = 5$. Therefore, the Average of list A is $5 + 1 = 6$. The *Total* of list A is then $5 \times 6 = 30$ and $x = 30 - 20 = 10$. In this case, the two quantities are equal. Eliminate choice (B). The correct answer is (D).

7. B

Plug In an easy number for the radius (r) of circle N such as $r = 10$. If the radius of circle O is 6 less than radius of circle N , then the radius of circle O is $10 - 6 = 4$. The formula for the circumference of a circle is $C = 2\pi r$. The circumference of circle N is then $C = 2\pi 10 = 20\pi$. The circumference of circle O is $C = 2\pi 4 = 8\pi$. Therefore, the circumference of circle N minus the circumference of circle O is $20\pi - 8\pi = 12\pi$. If $\pi = 3.14$, then $12\pi = 12(3.14) = 37.68$. Since Quantity B is greater, the correct answer is (B).

8. A

This question involves selecting multiples items from one source. There are 6 spots for Quantity A. For the 1st spot there are 10 possible elements, for the 2nd spot there are 9, for the 3rd spot there are 8 and so on. Since the order of the elements doesn't matter, this is a combination question. Divide by the factorial of the number of items chosen from the source. The calculation is $\frac{10 \times 9 \times 8 \times 7 \times 6 \times 5}{6 \times 5 \times 4 \times 3 \times 2 \times 1} = 210$. Therefore, Quantity A is 210. There are 7 spots for Quantity B. Again, the order of the elements doesn't matter. The calculation is $\frac{10 \times 9 \times 8 \times 7 \times 6 \times 5 \times 4}{7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1} = 120$. Since Quantity A is greater, the correct answer is (A).

9. E

The formula for the area of a triangle is $A = \frac{1}{2}bh$. If the area of triangle PQR is 8, then

$8 = \frac{1}{2}bh$ or $16 = bh$. The ratio of the lengths of the two legs is 1 to 4. If one leg is x , then the other is $4x$. Thus, $bh = (4x)(x) = 4x^2$. Therefore, $16 = 4x^2$ which simplifies to $4 = x^2$ and $2 = x$. So, $4x = 8$ and the lengths of the legs are 2 and 8. Now, use the Pythagorean formula: $a^2 + b^2 = c^2$ to determine the length of the hypotenuse. In this case:

$$2^2 + 8^2 = (QR)^2$$

$$4 + 64 = (QR)^2$$

$$68 = (QR)^2$$

$$\sqrt{68} = QR$$

$$\sqrt{4 \times 17} = QR$$

$$2\sqrt{17} = QR. \text{ The correct answer is choice (E).}$$

10. D

Since this is a question about *work*, use a rate pie to determine the rates for Alan, Bob and Chad. The number of units for the entire job (*Work*) is not provided, so Plug In an easy number such as a multiple of the numbers in the question. Since the numbers are 7 and 11, Plug In 77 for the entire job. Draw a rate pie for Alan, Bob and Chad working together. If they can complete a job in 7 hours, then their combined rate is $77 \div 7 = 11$ units per hour. Next, draw a rate pie for Alan and Bob working together. If they can complete an entire job in 11 hours, then their combined rate is $77 \div 11 = 7$ units per hour. Therefore, Chad's rate working alone is $11 - 7 = 4$ units per hour. Draw a rate pie for Chad working alone at this rate. So, the number of hours it will take Chad working alone at his constant rate to complete the same job is $77 \div 4 = 19.25$ hours. The correct answer is (D).

11. $\frac{14}{5}$

Since the question involves a Quadratic Equation, factor it. Find two numbers that multiply to 10 and add to -7 . The numbers are -2 and -5 . Therefore,

$$x^2 - 7x + 10 = 0$$

$$(x - 2)(x - 5) = 0$$

$x - 2 = 0$ and $x - 5 = 0$. Thus, $x = 2$ and $x = 5$. So the two solutions are either $m = 2$ and $n = 5$, or $m = 5$ and $n = 2$. Notice that m and n are interchangeable in the expression so the value of the expression will be the same regardless of the choices for m and n . Thus, if

$m = 2$ and $n = 5$, the result is $\left(\frac{2+m}{m}\right)\left(\frac{2+n}{n}\right) = \left(\frac{2+2}{2}\right)\left(\frac{2+5}{5}\right) = \frac{4}{2} \times \frac{7}{5} = \frac{14}{5}$. The

correct answer is $\frac{14}{5}$.

12. D,F,G

Determine the pairs of positive even integers r and s that are less than 13, in which $r \neq s$, and $r - s > 0$. The pairs of positive even integers that satisfy those conditions are:

$$\begin{aligned}4 - 2 = 2 &= z \text{ and } r + s + z = 8 \\6 - 2 = 4 &= z \text{ and } r + s + z = 12 \\8 - 2 = 6 &= z \text{ and } r + s + z = 16 \\10 - 2 = 8 &= z \text{ and } r + s + z = 20 \\12 - 2 = 10 &= z \text{ and } r + s + z = 24\end{aligned}$$

Notice the pattern for $r + s + z$ thus far: the least value is 8, the greatest is 24 and contains every other even integer in between. Notice the results for the remaining pairs:

$$\begin{aligned}6 - 4 = 2 &= z \text{ and } r + s + z = 12 \\8 - 4 = 4 &= z \text{ and } r + s + z = 16 \\10 - 4 = 6 &= z \text{ and } r + s + z = 20 \\12 - 4 = 8 &= z \text{ and } r + s + z = 24 \\8 - 6 = 2 &= z \text{ and } r + s + z = 16 \\10 - 6 = 4 &= z \text{ and } r + s + z = 20 \\12 - 6 = 6 &= z \text{ and } r + s + z = 24 \\10 - 8 = 2 &= z \text{ and } r + s + z = 20 \\12 - 8 = 4 &= z \text{ and } r + s + z = 24 \\12 - 10 = 2 &= z \text{ and } r + s + z = 24\end{aligned}$$

The pattern for $r + s + z$ continued. Thus, the only possible values for the sum of r , s , and t are 8, 12, 16, 20, and 24. Of those values, the only ones listed in the answer choices are 8 in choice (D), 12 in choice (F), and 24 in choice (G). The correct answer is (D), (F), and (G).

13. D

Since there are exponents, rewrite the equation using common bases. $243 = 3^5$ and $9 = 3^2$. Therefore, $243^x = 9^y$ can be rewritten as $3^{5x} = 3^{2y}$. Now solve for y . Thus, $\frac{3^{5x}}{3^2} = y$. Next, use the Divide-Subtract exponent rule. Therefore, $y = 3^{5x-2}$. The correct answer is (D).

14. B

To answer this question, use the information in the bar graph. States *other than* California, Texas, Oregon, Utah, and Wyoming are the East Coast and the Rest of US. Sales for the East Coast are \$10 million and for the Rest of US are approximately \$14 million. Thus, the total is $10 + 14 = 24$ million. Total sales for Company T in the US is approximately \$59 million. So the question is: *24 million is what percent of 59 million?*

Translate the question into an equation: $24 \text{ million} = \frac{x}{100}(59 \text{ million})$ and solve for x. So x is approximately 40.68%. The correct answer is (B).

15. B

Note: The first sentence of the question should reference *Company T sales in Oregon not Florida. Our apologies for the confusion.*

First use the bar graph to determine that Company T sales in Oregon are approximately \$9 million. If they are 4 times Company T sales in France, then the sales in France are $\frac{9}{4} = 2.25$ million. The circle graph indicates that sales in Europe are 26% of Sales

Worldwide. The total amount of Worldwide Sales is not provided. However, total US Sales is provided which is \$59.1 million. If US sales are 45% of Worldwide Sales, then the calculation for Worldwide Sales is $59.1 = \frac{45}{100}x$ and $x = \$131.33$ million. Europe is then 26% of \$131.33 = \$34.15 million. To determine the percentage that Company T sales in France are of Company T sales in Europe, the calculation is $2.25 = \frac{x}{100}(34.15) = 6.59\%$.

The correct answer is choice (B).

16. A, C

Use the circle graph to evaluate choice (A). US sales are 45% of Worldwide sales. Europe is 26% and China is 17%. Since $26\% + 17\% = 43\%$, which is less than 45%, Company T sales in the US are greater than Company T sales in Europe and China combined. The first statement is true, so select choice (A). Use the bar graph to evaluate choice (B). Company T sales in Utah are approximately \$3 million which is less than the East Coast sales of \$10 million. However, there is no breakdown by individual states in the East Coast. Therefore, it's impossible to determine whether Company T sales in Utah were less than Company T sales in *any* East Coast state. The second statement is false, so eliminate choice (B). Use the bar graph to evaluate the last statement. Company T sales in California are approximately \$13 million and in Texas are approximately \$9.5 million. Combined sales in these two states is then $13 + 9.5 = 22.5$ million. Since Total US sales is \$59.1 million and $30\% \text{ of } 59.1 = 17.73$, Company T sales in California and Texas combined is more than 30% of Company T sales in the US. The last statement is true, so select choice (C). The correct answer is (A) and (C).

17. C

The *median* is the middle number after the 25 integers have been arranged in ascending order. So the middle number, or the 13th integer, is 13. The question states that the greatest of the 25 integers is 32, so the 25th integer is 32. Since the question asks for the *least* possible average, use the least possible value of each integer. The least possible positive integer for the 1st through 12th integers is 1. The least possible positive integer for the 14th through 24th integers is 13. Now, use an Average Pie to determine the *Average*. The *Total* is $(12)(1) + 13 + (11)(13) + 32 = 200$. The *# of things* is 25. Therefore, the *Average* is $\frac{200}{25} = 8$. The correct answer is (C).

18. E

This question involves probability which is $\frac{\# \text{ of possible outcomes that satisfy condition}}{\# \text{ of total possible outcomes}}$

or $\frac{\text{want}}{\text{total}}$. In this case, *want* is the number of ways to select 6 workers, with only 1 worker having an engineering degree. The *total* is the number of ways to select 6 workers from the 15 workers available. The answer choices are expressed in choose notation which is written as $\binom{n}{r}$ where n is the number of things to choose from and r is the number of things selected (choose r things from n). The number of ways 6 workers can be selected from 15 workers is then $\binom{15}{6}$. To select 6 workers , with only 1 worker having an engineering degree is to select 1 of 4 workers *with* an engineering degree and select 5 of 11 workers *without* an engineering degree which is $\binom{4}{1}\binom{11}{5}$. Therefore, the probability that only 1 of the 6 workers selected has an engineering degree out of the 15 workers available is $\frac{\binom{4}{1}\binom{11}{5}}{\binom{15}{6}}$. The correct answer is (E).

19. 21.7

Since the question involves percents, Plug In an easy number for the value of Jill's house in 2013 such as 100. If her house increased by 15% percent, then the value of her house in 2014 is $100 \times 1.15 = 115$. The values of Jill and Roxanne's houses are equal in 2014 and Roxanne's house decreased by 10% from 2013 to 2014. Thus, the value of Roxanne's house in 2013 is $115 = 0.9x$ and $x = 127.78$. Now, use the percent change formula: $\frac{\text{difference}}{\text{original}} \times 100$ to determine the *percent less* for Jill's house in 2013 compared to the value of Roxanne's house in 2013.

$\frac{127.78 - 100}{127.78} \times 100 = \frac{27.78}{127.78} \times 100 = 21.74\%$. The question asks for the answer to the nearest 0.1 percent, so the correct answer is 21.7

20. A,B

The question states that the probability of event F is $\frac{1}{4}$ and the probability of event G is $\frac{3}{5}$. No other information is provided about the relationship between the events. The question does not indicate that the events are independent or that they are mutually exclusive. The event that both F and G occur is all outcomes in the set $F \cap G$. So calculate the minimum possible value and the maximum possible value of the probability of the event $F \cap G$. The minimum possible value is where there is no intersection between F and G , so that probability is 0. The maximum possible value is where F is completely inside G , so that probability is $\frac{1}{4}$. Therefore, the probability that the event $F \cap G$ both occur is any number from 0 to $\frac{1}{4}$. Of the answer choices, only $\frac{1}{5}$ and $\frac{1}{4}$ fall in that range. The correct answer is (A) and (B).

Lesson 8 Math

Full Section Math Drill Three (page 362)

1. B

The formula for the area of a parallelogram is $A = bh$. The question indicates that the length of the base is an integer and the area is 40. Therefore, the length of the height, which is perpendicular to the base, must also be an integer. To find possible values for the length of the height, factor 40. The factors of 40 are 1×40 , 2×20 , 4×10 , and 5×8 . Using those factors for the lengths of the base and height, results in 8 possible parallelograms: base 1 height 40, base 40 height 1, base 2 height 20, base 20 height 2, base 4 height 10, base 10 height 4, base 5 height 8, and base 8 height 5. Each of these 8 parallelograms has a different perimeter. Therefore, Quantity B is 8. Since Quantity B is greater, the correct answer is (B).

2. C

This is a Quant Comp question with variables, so Plug In. Use an easy number such as $d = 3$. In that case, $a = (3 + 2)^2 = 5^2 = 25$ and $b = (3 - 2)^2 = 1^2 = 1$. Quantity A is then $3^2 + 4 = 9 + 4 = 13$. Use an Average Pie to calculate the average of a and b for Quantity B. The Total is $25 + 1 = 26$ and the # of things is 2. Therefore, the Average is $\frac{26}{2} = 13$. The two quantities are equal, so eliminate answer choices (A) and (B). Now, Plug In again using FROZEN. Try Zero. If $d = 0$, then $a = (0 + 2)^2 = 4$ and $b = (0 - 2)^2 = 4$. Quantity A is now $0^2 + 4 = 4$ and Quantity B is now $\frac{4 + 4}{2} = \frac{8}{2} = 4$. The two quantities are equal again.

Continue Plugging In until all the FROZEN options are exhausted. Regardless of which values are used, notice that the average of a and b is

$$\begin{aligned}\frac{a+b}{2} &= \frac{(d+2)^2 + (d-2)^2}{2} = \frac{(d+2)(d+2)(d-2)(d-2)}{2} \\ &= \frac{d^2 + 4d + 4 + d^2 - 4d + 4}{2} \\ &= \frac{2d^2 + 8}{2} = d^2 + 4\end{aligned}$$

Therefore, the two quantities are always equal. The correct answer is (C).

3. D

This is a Quant Comp question with variables. Normally, the next step is to Plug In. However, for this question, notice that the first equation indicates that $y = x + 3$. So, Plug In $x + 3$ for y in the second equation. Thus,

$$\frac{x^2}{y} = 4 \text{ is } \frac{x^2}{x+3} = 4. \text{ Next, clear the fraction.}$$

$x^2 = 4x + 12$. Rewrite the equation in Quadratic form.

$x^2 - 4x - 12 = 0$. Now factor.

$$(x-6)(x+2) = 0$$

$x = 6$ and $x = -2$.

If $x = 6$, then Quantity B is greater, so eliminate answer choices (A) and (C). If $x = -2$, then Quantity A is greater. Eliminate choice (B). The correct answer is (D).

4. B

This is a Quant Comp question with variables, so Plug In. Use an easy number for the value of x , such as $x = 2$. Thus, two sides of the isosceles triangle are each 2. Since the length of the third side of a triangle is less than the sum and greater than the difference of the lengths of the other two sides, $2 - 2 < y < 2 + 2$ or $0 < y < 4$. So, Plug In a value for y within that range, such as $y = 3$. Quantity A is then $2(2) + 3 = 4 + 3 = 7$ and Quantity B is $4(2) = 8$. Since Quantity B is greater, eliminate answer choices (A) and (C). Now, Plug In again using FROZEN. Try using One. If $x = 1$, then $1 - 1 < y < 1 + 1$ or $0 < y < 2$. So, Plug In $y = 1$. Now Quantity A is $2(1) + 1 = 3$ and Quantity B is $4(1) = 4$. Quantity B is still greater. Continue Plugging In until all the FROZEN options are exhausted. Regardless of which values are used, since y is the third side of the triangle, it must be less than the sum of $x + x$. Thus, $y < 2x$. Therefore, Quantity A, which is $2x + y$, is less than $4x$ and Quantity B is *always* greater. The correct answer is (B).

5. A

This is a Quant Comp question with variables, so Plug In. Start by Plugging In an easy number, such as $w = 5$. If there are 5 fewer women than men, then there are $5 + 5 = 10$ men. The total number of people at the PTA meeting is $5 + 10 = 15$, which is Quantity A. Quantity B is $2w - 5 = 2(5) - 5 = 10 - 5 = 5$. Since Quantity A is greater, eliminate answer choices (B) and (C). Now, Plug In again using FROZEN. Try an Extreme number such as $w = 100$. Then the number of men is $100 + 5 = 105$ and the total number of people at the PTA meeting is now $100 + 105 = 205$. Quantity B is now $2w - 5 = 2(100) - 5 = 200 - 5 = 195$. Quantity A is still greater. Continue Plugging In until all the FROZEN options are exhausted. Regardless of which values are used, notice that translating the phrase in Quantity A into an equation is $w + (w + 5) = 2w + 5$. Since Quantity B is $2w - 5$, Quantity A is *always* 10 greater than Quantity B. The correct answer is (A).

6. D

This is a Quant Comp question with unknown values, so Plug In. Plug In an easy value for the distance between A and C, such as 10. If B is the midpoint of AC, then the length of BC is 5. If the distance between B and D is 8, then the distance between C and D is $8 - 5 = 3$. Since Quantity A is 10 and Quantity B is 3, Quantity A is greater, so eliminate answer choices (B) and (C). Now, Plug In again using FROZEN. Try using One. If the distance between A and C is 1, then the length of BC is 0.5, and the distance between C and D is $8 - 0.5 = 7.5$. Now, Quantity B is greater, so eliminate choice (A). The correct answer is (D).

7. D

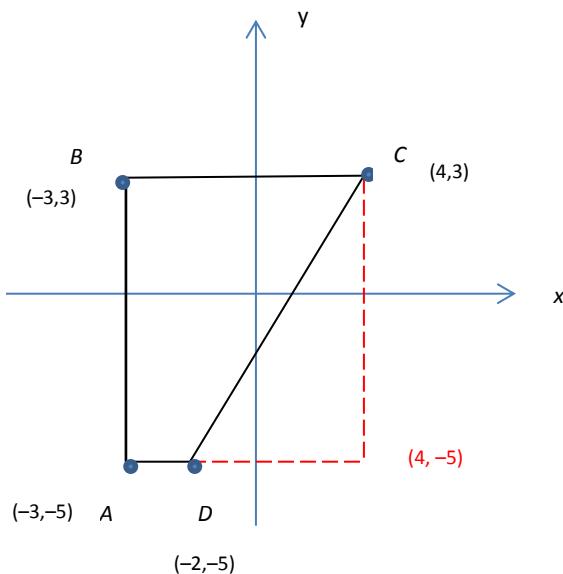
The question states that 1 of the numbers in set N is *neither positive nor negative*. Therefore, that number is 0. The *median* is the middle number after the numbers have been arranged in ascending order. Since 3 of the remaining numbers are positive and 3 are negative, 0 is the median. Thus, Quantity A is 0. Plug In easy values for the 3 positive numbers such as 2, 3, and 4 as well as for the 3 negative numbers such as $-4, -3$, and -2 . Use an Average Pie to calculate the average of the numbers in set N . The *Total* is $(-4) + (-3) + (-2) + 0 + 2 + 3 + 4 = 0$ and the *# of things* is 7. Therefore, the *Average* is $0 \div 7 = 0$. The two quantities are equal, so eliminate answer choices (A) and (B). Now, Plug In again using FROZEN. Try using One for the positive numbers. Now, the *Total* is $(-4) + (-3) + (-2) + 0 + 1 + 1 + 1 = -6$ and the *Average* is $\frac{-6}{7}$. Since the median is still 0, Quantity A is 0 which is greater than $\frac{-6}{7}$. So, eliminate choice (C). The correct answer is (D).

8. B

The formula for the circumference of a circle is $C = 2\pi r$. If the circumference of circle A is 6π , then $2\pi r = 6\pi$ and $r = 3$. The formula for the area of a circle is $A = \pi r^2$. Thus, the area of circle A is $\pi(3)^2 = 9\pi$. If the circumference of circle B is 12π , then $2\pi r = 12\pi$ and $r = 6$. The area of circle B is then $\pi(6)^2 = 36\pi$. Therefore, the ratio of the area of circle A to the area of circle B is $9\pi : 36\pi$ or $\frac{9\pi}{36\pi} = \frac{1}{4}$. The correct answer is (B).

9. C

Draw the figure. For ease of explanation, label the vertices $(-3, -5)$, $(-3, 3)$, $(4, 3)$ and $(-2, -5)$ as A , B , C and D as shown in the figure below. The distance from point A to point B is $3 - (-5) = 8$. The distance from point B to point C is $4 - (-3) = 7$. To determine the distance from point C to point D , drop a line to create a right triangle in which DC is the hypotenuse. The coordinates of the right angle are $(4, -5)$. Thus, the lengths of the legs of the right triangle are $4 - (-2) = 6$ and $3 - (-5) = 8$. Recognize the Pythagorean triple 6-8-10. Thus, the length of the hypotenuse DC is 10. Finally, the length of the last side of quadrilateral $ABCD$ is $(-2) - (-3) = 1$. Therefore, the perimeter of quadrilateral $ABCD$ is $8 + 7 + 10 + 1 = 26$. The correct answer is (C).

**10. C,D**

Since there are variables, Plug In. Use an easy number such as $x = 2$. Now, check the answer choices to determine which functions $f(2) = f(-2)$. For choice (A), the $f(2) = 2^3 + 2 = 8 + 2 = 10$. The $f(-2) = (-2)^3 + (-2) = (-8) + (-2) = -10$. Since 10 does not equal -10 , eliminate choice (A). For choice (B), the $f(2) = 2(2 + 1) = 2(3) = 6$. The $f(-2) = (-2)(-2 + 1) = (-2)(-1) = 2$. Since 6 does not equal 2, eliminate choice (B). For choice (C), $f(2) = 2(2^3 + 2) = 2(10) = 20$. The $f(-2) = (-2)(-2^3 - 2) = (-2)(-10) = 20$. Since $20 = 20$, $f(2) = f(-2)$, so select choice (C). For choice (D), $f(2) = 2^2(2^2 - 1) = 4(3) = 12$. The $f(-2) = (-2^2)(-2^2 - 1) = 4(3) = 12$. Since $12 = 12$, $f(2) = f(-2)$, so select choice (D). The correct answer is (C) and (D).

11. B

Since there are exponents, rewrite 0.01 percent using common bases. 0.01 percent is

$$\frac{1}{100} = \frac{1}{100} \times \frac{1}{100} = \frac{1}{10,000} = \frac{1}{10^4}. \text{ If } 0.01 \text{ percent of } 10^m \text{ is equal to } 10^n, \text{ then}$$

$$\frac{1}{10^4} \times 10^m = 10^n. \text{ That can be rewritten as } \frac{10^m}{10^4} = 10^n. \text{ Now, use the Divide-Subtract}$$

exponent rule which results in $10^{m-4} = 10^n$. Therefore, $m - 4 = n$. The correct answer is (B).

12. A

Standard deviation describes the spread of data from the mean. Estimate the standard deviation of the distribution of X using the standard normal distribution. Approximately, 2% + 14%, or 16% of the standard normal distribution is greater than 1. Thus, 84% of the distribution is less than 1. The value 1 represents 1 standard deviation above the mean. Therefore, the 85th percentile is slightly greater than 1 standard deviation above the mean. If the 85th percentile is 510, then the difference between 510 and the mean of 390 is slightly greater than 1 standard deviation. Since $510 - 390 = 120$, the standard deviation is *less* than 120. Therefore, the best estimate from the answer choices is 115 since it is close to but *less* than 120. The correct answer is (A).

13. C

Since there is an unknown total (the number of textbooks), this is a Hidden Plug In. The answers are expressed as percentages, so Plug In 100 for the number of textbooks. If 40% of the textbooks are math texts, then there are $40\% (100) = 40$ math texts. The remainder consists of an equal number of biology, physics, chemistry and history texts. The remainder is $100 - 40 = 60$. An equal number of the 4 types of books is then

$$\frac{60}{4} = 15. \text{ If the manufacturer sold } \frac{4}{5} \text{ of the math textbooks, then he sold } \frac{4}{5} \times 40 = 32$$

math textbooks. If he sold $\frac{1}{3}$ of the biology texts, then he sold $\frac{1}{3} \times 15 = 5$ biology texts. If

he sold $\frac{2}{3}$ of the physics texts, then he sold $\frac{2}{3} \times 15 = 10$ physics texts. If he sold $\frac{1}{6}$ of the

chemistry books, then he sold $\frac{1}{6} \times 15 = 2.5$ chemistry texts. If he sold $\frac{1}{2}$ of the history

books, then he sold $\frac{1}{2} \times 15 = 7.5$ history texts. Therefore the percent of the batch of textbooks sold is $32 + 5 + 10 + 2.5 + 7.5 = 57\%$. The correct answer is (C).

14. B

To answer this question, use the information in the table. The number of blue cars sold in 2002 is 4.5 million. If the car company sold 15% of all the blue cars that year, then it sold $15\%(4,500,000) = 675,000$ cars. If the company's price for the different models of its blue cars ranges from \$12,000 to \$48,000 then the revenue is between $675,000(\$12,000)$ and $675,000(\$48,000)$ or between \$8.1 billion and \$32.4 billion. Therefore, $8.1 < x < 32.4$. The correct answer is (B).

15. C

To answer this question, use the bar graph. Notice that revenue is in billions of dollars. Car sales in 2002 are 1,080 and car sales in 2005 are approximately 1,165. Use the percent change formula $\frac{\text{difference}}{\text{original}} \times 100$ to calculate the percent increase in revenue.

$$\frac{1,165 - 1,080}{1,080} \times 100 \approx 7.87\%. \text{ Therefore, the approximate percent increase in total}$$

revenue from all car sales from 2002 to 2005 is 8%. The correct answer is (C).

16. E,F

Use an Average Pie to determine the number of cars sold in 2002. The bar graph indicates that the *Total* revenue from all cars sold in 2002 is \$1,080 billion. The *Average* is \$30,000. Thus, the number of all cars sold (*the # of things*) is

$$\frac{1,080,000,000,000}{30,000} = 36,000,000. \text{ The table indicates that the total number of cars sold}$$

for the 9 colors listed is 31 million. Therefore, the total number of cars sold that year for colors *other than* the nine listed is $36,000,000 - 31,000,000 = 5,000,000$. The only colors in which the number of cars sold was greater than 5 million were Red (5.8 million) and Silver (6.7 million). The correct answer is (E) and (F).

17. E

Since there are variables in the answer choices, Plug In. Use an easy number such as $x = 10$. If 10 dollars is invested now and the value of the CD triples every 6 years, then in 6 years the value is $3 \times 10 = 30$ dollars. In 12 years, the value is $3 \times 30 = 90$ dollars. In 18 years, the value is $3 \times 90 = 270$ dollars. That is the target answer, so circle it. Now check the answer choices. Choice (A) is $3(10^3) = 3,000$ which does not match the target, so eliminate it. Choice (B) is $10^3 = 1,000$ which does not match the target. Eliminate it. Choice (C) is $6(10^2) = 600$. Eliminate it. Choice (D) is $9 \times 10 = 90$. Eliminate it. Choice (E) is $27 \times 10 = 270$ which matches the target. The correct answer is (E).

18. B,C,D,E

Standard deviation describes the spread of data from the mean. Since the mean of the distribution is 15 and the standard deviation is 3, the number of customers within 2 standard deviations above the mean is $15 + 2(3) = 15 + 6 = 21$. The number of customers within 2 standard deviations below the mean is $15 - 2(3) = 15 - 6 = 9$. Therefore, the number of customers is between 9 and 21 which is 10, 12, 15 and 19. The correct answer is (B), (C), (D), and (E).

19. E

If the 5th term in the sequence is -75 and each term after the first is found by subtracting 4 from the previous term and multiplying the result by 3, then the 6th term is $(-75 - 4)(3) = (-79)(3) = -237$. That is not one of the answer choices. So, calculate the 4th term in the sequence. To find the previous term in the sequence, *divide* by 3 and *add* 4.

Thus, $\frac{-75}{3} + 4 = (-25) + 4 = -21$. The correct answer is (E).

20. 20

Let x represent the positive integer. Thus, the reciprocal is $\frac{1}{x}$. Moving the decimal point

two places to the left is the same as multiplying the number by 10^{-2} . Use that

information to translate the question into an equation. $\frac{1}{x} \times 4 = x(10^{-2})$. Now simplify.

$\frac{4}{x} = 10^{-2}x$. Clear the fraction. $4 = 10^{-2}x^2$ or $4 = \frac{x^2}{10^2}$. Next, solve for x . Thus,

$4(10^2) = x^2$ or $400 = x^2$ and $20 = x$. The correct answer is 20.

Lesson 8 Verbal

Full Section Verbal Drill One (page 380)

1. E

The blank describes the wife's nature. The clue is *she quickly changed her opinion and just as quickly changed it back*. So "changeable" is a good word for the blank. Choice (A), *florid*, which means flushed with rosy color, is not a good match. Eliminate it. Choice (B), *painstaking*, which means meticulous, is not a good match. Eliminate it. Choice (C), *laconic*, which means using few words, is not a good match. Eliminate it. Choice (D), *effusive*, which means gushing with emotion, is not a good match. Eliminate it. Choice (E), *erratic*, which means unpredictable or inconsistent, is a good match. Keep this choice. The correct answer is (E).

2. D

The blank describes the teen's explanations. The clue is *increasingly elaborate and tortuous*. So, recycle the clue and use "elaborate" as the word for the blank. Choice (A), *opaque*, which means nontransparent, is not a good match. Eliminate it. Choice (B), *conventional*, is not a good match. Eliminate it. Choice (C), *lucid*, which means clear, is not a good match. Eliminate it. Choice (D), *byzantine*, which means excessively complicated, is a good match. Keep this choice. Choice (E), *boorish*, which means coarse or uncouth, is not a good match. Eliminate it. The correct answer is (D).

3. B and F

This is a two blank text completion question, so begin by working with the easier blank. The second blank seems to be the better starting point. It is an adjective that describes the new form of writing. The clue is *nearly every classical literary work is in Carolingian*. So, "common" is a good word for the second blank. Choice (D), *intermittent*, which means sporadic, is not a good match. Eliminate it. Choice (E), *equivocal*, which means ambiguous, is not a good match. Eliminate it. Choice (F), *ubiquitous*, which means pervasive, is a good match. Keep this choice. Now use the completed second blank to assist in answering the first blank which is a verb that describes *one example* as it relates to the common impression of the Dark Ages. The clue is *the common impression of the "Dark Ages" as a period of intellectual stagnation is the development of Carolingian minuscule, the first recognizably modern handwriting. So [ubiquitous] was the new form of writing...* Thus, this *new form* of writing was an example that contradicts the common impression of the Dark Ages as a period of stagnation. So, "contradicts" is a good word for the first blank. Choice (A), *caricatures*, which means lampoons, is not a good match. Eliminate it. Choice (B), *believes*, which means contradicts, is a good match. Keep this choice. Choice (C), *substantiates*, is not a good match. Eliminate it. The correct answer is (B) and (F).

4. C and D

This is a two blank text completion question, so begin by working with the easier blank. The second blank seems to be the better starting point. It describes the purpose of ads that publicize the opponent. The clue is from the first sentence: *ads that attack political adversaries by name*. So use “attack” as the word for the second blank. Choice (D), *condemn*, is a good match. Keep this choice. Choice (E), *laud*, which means to praise, is opposite in meaning of the word for the blank. Eliminate it. Choice (F), *recount*, is not a good match. Eliminate it. Now use the completed second blank to assist in answering the first blank which is a noun that describes these ads. The clue is *despite the recent and many analysts have begun to regard the strategy with skepticism*. So use “strategy” as the word for the blank. Choice (A), *paucity*, which means scarcity, is not a good match. If *many analysts* regard the strategy with skepticism, there can’t be a *scarcity* of ads. Eliminate this choice. Choice (B), *novelty*, which is the quality of being unique, is not a good match. There is no indication that these types of ads are unique. Eliminate this choice. Choice (C), *proliferation*, which means an increase, does not match “strategy”. However, when considering it as the word for the blank, it does result in a sentence that is logically coherent and in keeping with the second blank. Keep this choice. The correct answer is (C) and (D).

5. B, D, G

This is a three blank text completion question, so begin by working with the easiest blank. The first blank seems to be the best starting point. It is a noun that describes economic policies in relation to the previous crisis. The clue is *economic policy is primarily reactionary*. So, use “reactions to” as the word for the blank. Choice (A), *ignorant of*, is not a good match. Eliminate it. Choice (B), *responses to*, is a good match. Keep this choice. Choice (C), *peripheral to*, is not a good match. Eliminate it. Now it makes sense to work with the second blank which describes the management of the current boom. The clue is *rather than focusing on*. The contrasting word *rather* indicates that the word for the second blank is opposite in meaning of the first blank. So, *economic policies tend to be [responses to] the previous crisis, rather than focusing on “careful” management of the current boom*. Use “careful” as the word for the second blank. Choice (D), *prudent*, which means well advised or sensible, is a good match. Keep this choice. Choice (E), *sparing* is not a good match. Eliminate it. Choice (F), *irrational*, is opposite in meaning of the word for the blank. Eliminate it. Now use the completed first and second blanks to assist with answering the third blank which describes the type of investments that collapse as another recession begins. The clue is *unrestrained financial growth leads to rampant speculation, and soon even seemingly...* The word for the blank is a contrast to *unrestrained financial growth* and *rampant speculation*. So, “stable” is a good word for the third blank. Choice (G), *solid*, is a good match. Keep this choice. Choice (H), *tenuous*, which means unsubstantiated, is opposite in meaning of the word for the blank. Eliminate it. Choice (I), *unstable*, is also opposite in meaning of the word for the blank. Eliminate it. The correct answer is (B), (D) and (G).

6. B, E, H

This is a three blank text completion question, so begin by working with the easiest blank. The first blank seems to be the best starting point. It is an adjective that describes the consequences for the general population. The clue is *an increase in the cost of food staples*. Logically, an increase in the cost of food staples should have negative consequences for the general population. So use “negative” as the word for the first blank. Choice (A), *unexpected*, is not a good match. Eliminate it. Choice (B), *adverse*, is a good match. Keep this choice. Choice (C), *advantageous*, is opposite in meaning of the word for the blank. Eliminate it. Now work with the second blank which describes the need for steep agricultural subsidies. The clue is *such an increase would ...the need for the steep agricultural subsidies that the government currently pays farmers*. If the prices of the food *increase*, the agricultural subsidies should *decrease*. Use “decrease” as the word for the second blank. Choice (D), *squander*, is not a good match. Eliminate it. Choice (E), *abate*, which means to lessen or decrease, is a good match. Keep this choice. Choice (F), *drive*, is not a good match. Eliminate it. Now use the completed first and second blanks to assist with answering the third blank which describes the type of help taxpayers would receive for the increased food expenditures. The clue is *it is unlikely that the savings would be passed along to the tax payer*. Thus, the savings would not help counteract the increased food expenditures. So use “counteract” as the word for the third blank. Choice (G), *augment*, which means to make bigger, is not a good match. Eliminate it. Choice (H), *offset*, is a good match. Keep this choice. Choice (I), *flag*, which means to lose energy or interest, is not a good match. Eliminate it. The correct answer is (B), (E) and (H).

7. B

The subject of the question is *the difficulties associated with blood transfusions*. The task is indicated by the phrase *the author mentions...in order to*. To answer the question, analyze the passage and determine the reason that the author mentions the subject. The author claims that *rudimentary anticoagulants were developed as early as 1960, solving the first obstacle, and Landsteiner's classification of ABO blood groups in 1900 was presumed capable of concluding the second*. In the next sentence, the author claims that *a small percentage of recipients still experienced symptoms that paralleled those of a hemolytic reaction*. The author then provides information about *later advances in blood analysis*. Thus, it appears that the author mentions the difficulties to introduce the discussion of the various solutions. Choice (A) uses the extreme language *criticize the simplicity* which is not supported by the text. Eliminate it. Choice (B) is a paraphrase of the reason that the author mentions the difficulties. Keep this choice. Choice (C) uses the extreme language *it will never be possible* which is not supported by text. Eliminate it. Choice (D) uses the extreme language *argue for increased measures* which is not supported by the text. Eliminate it. Choice (E) mentions *best practices for blood transfusions*. There is no such comparison to *best practices* in the text. Eliminate it. The correct answer is (B).

8. B

The subject of the question is *transfusions*. The task is indicated by the phrase *the passage suggests that the author believes*. To answer the question, evaluate the answer choices and determine which is supported by the passage regarding the author's beliefs about transfusions. Choice (A) is a reversal of fact. The last sentence of the passage claims that *white blood cells may attack new blood from even seemingly suitable donors*. Therefore, ABO and Rh matching, when used together, are *not* sufficient to ensure a successful transfusion. Eliminate this choice. Choice (B) is supported by the last sentence of the passage: *Later advances in blood analysis revealed not only that there are numerous additional blood groups with which donors may be incompatible, notably the Rh system, but also that white blood cells may attack new blood from even seemingly suitable donors*. Thus, it appears that white blood cells are classified according to different classifications. Keep this choice. Choice (C) uses the extreme language *the majority of blood transfusion recipients died* which is not supported by the text which mentions *occasionally fatal hemolytic reactions*. Eliminate this choice. Choice (D) uses the extreme wording *will eliminate* which is not supported by the text since *white blood cells may attack new blood from even seemingly suitable donors*. Eliminate this choice. Choice (E) uses the comparison words *depends more on*. There is no such comparison in the text that donor-to-recipient blood compatibility depends *more* on some blood groups than others. Eliminate this choice. The correct answer is (B).

9. A

The subject of the question is the passage as a whole. The task is indicated by the phrase *primary purpose*. To answer the question, determine the reason that the author wrote the passage and then evaluate the answer choices, eliminating any which do not match the author's purpose. The author claims that *human-to-human blood transfusions in the nineteenth century were plagued by two major problems*. The author then mentions the problems. He provides the solution to the first problem and what was thought to be the solution to the second problem and then discusses later advances. Choice (A) is a paraphrase of the primary purpose of the passage. Keep this choice. Choice (B) does not match the primary purpose. The purpose of the passage is not to describe the *origins of human blood transfusions*. Eliminate it. Choice (C) is too narrow. Although the difficulties associated with transfusing different blood types is mentioned in the passage, it is not the *primary* purpose. Eliminate it. Choice (D) is incorrect. The passage does not *recommend improvements*. Eliminate it. Choice (E) is too narrow. Although blood groups are mentioned in the passage, it is not the *primary* purpose. Eliminate it. The correct answer is (A).

10. B

The subject of the question is *traditional republican values in the era of Augustus*. The task is indicated by the phrase *the passage suggests*. To answer this inference question, determine what the passage claims about traditional republican values and then evaluate the answer choices to determine which is supported by the passage. In the second paragraph, the author claims that *Senatorial provinces, conversely, were governed by proconsuls chosen by the Senate, thus reflecting the time-honored republican belief in the balance of power. In addition to restoring prestige to the Senate as a body, this development opened up one of the primary offices by which Roman aristocrats had traditionally achieved status*. Now, check the answer choices. Choice (A) uses the extreme wording *only* which is not supported by the text. The second paragraph indicates that the Senate *opened up one of the primary offices by which Roman aristocrats had traditionally achieved status*. It does not state that it is the *only* way. Eliminate this choice. Choice (B) is supported by the text. The first sentence in the second paragraph claims that *the most visible element of the provincial reform...was the division of the Empire into two types of provinces: imperial and Senatorial. In imperial provinces...Augustus retained the highest official form of power... Senatorial provinces, conversely, were governed by proconsuls chosen by the Senate*. Therefore, an autonomous Senate was considered a *significant* element. Keep this choice. Choice (C) uses the recycled language *proconsular imperium over the entire Empire* from the last sentence of the passage which is not a discussion of *traditional republican values*. Additionally, the answer is a reversal of fact. The passage states in the second paragraph regarding traditional republican values that Augustus had proconsular imperium over the *imperial provinces* not the *entire Empire*. Eliminate this choice. Choice (D) is also a reversal of fact. The passage states in the fourth paragraph that *the provinces held most of the army*. Therefore, the army was not *evenly distributed throughout the Empire*. Eliminate this choice. Choice (E) is a memory trap for the *dyarchy* mentioned at the end of the third paragraph. However, it is not part of the discussion of *traditional republican values*. Eliminate it. The correct answer is (B).

11. C

The subject of the question is the passage as a whole. The task is indicated by the phrase *can be answered by information in the passage*. To answer the question, evaluate the answer choices and determine which can be answered by the passage. Choice (A) uses the recycled language *resign the Roman consulship in 23 BCE* which is discussed at the end of the second paragraph. However, the text does not mention the *reasons* for the resignation. Eliminate it. The *Cyrene Edicts* are discussed in the last paragraph. However, there is no mention of what accounts for their *preservation* as suggested in Choice (B). Eliminate it. Choice (C) can be answered by the text in the second paragraph which states, *In addition to restoring prestige to the Senate as a body, this development also opened up one of the primary offices by which Roman aristocrats had traditionally achieved status*. Keep this choice. Choice (D) uses the recycled language *first* and *present himself as princeps*. The first paragraph states that *Augustus took pains to present himself...but as princeps – first among equals*. It does not indicate that Augustus was the *first to present himself as princeps*. Eliminate it. Choice (E) uses the comparison word *more*. Although imperial and Senatorial provinces are discussed in the second paragraph, there is no such comparison regarding the number of each. Eliminate this choice. The correct answer is (C).

12. E

The subject of the question is the *Cyrene Edicts*. The task is indicated by the phrase *according to the passage, the Cyrene Edicts are important because*. To answer the question, analyze the passage and determine the reason that the *Cyrene Edicts* are important. The passage claims in the last paragraph that *they show Augustus intervening in such local issues as the empanelling of jurors. The degree to which the discovery of the Cyrene Edicts shattered the historical orthodoxy...* Therefore, the discovery of the *Cyrene Edicts* calls into question the previously held vision of joint rule between *princeps* and *Senate*. Choice (A) uses the recycled language *empanelling of jurors* and is not supported by the passage. Eliminate it. Choice (B) uses the extreme language *were too extreme*. The passage states that Syme's work was *epoch-making* but does not indicate that it was *too extreme*. Eliminate it. Choice (C) uses the extreme language *conclusively refuted Mommsen's assessment*. The passage states that the *Edicts shattered the historical orthodoxy* not that they *conclusively refuted* it. Eliminate this choice. Choice (D) is not the reason that the *Edicts* are important. The passage states that the *Edicts* show that Augustus intervened in local issues not that he *reorganized the Roman provinces* which is a memory trap from the beginning of the second paragraph which is not a discussion of the importance of the *Edicts*. Eliminate it. Choice (E) is supported by the passage. They cast doubt on the previously held views of Augustus' authority and that is why they are important. Keep this choice. The correct answer is (E).

13. B and C

The blank describes how every new scientific theory is viewed. The clue is *challenges the reigning orthodoxy*. So, “questionable” is a good word for the blank. Choice (A), *dichotomous*, which means divided into two parts, is not a good match. Eliminate it. Choice (B), *suspect*, is a good match. Keep this choice. Choice (C), *heretical*, which means unorthodox, is a good match. Keep this choice. Choice (D), *middling*, which means moderate or mediocre, is not a good match. Eliminate it. Choice (E), *critical*, and Choice (F), *inconsequential*, are not good matches. Eliminate these choices. The correct answer is (B) and (C).

14. B and D

The blank describes the former concept, “please.” The clue is *the latter (“thank you”) is quite commonly heard and read in daily communication*. The contrasting transition word *while* indicates that the word for the blank is opposite in meaning of the clue. So, the *former* is not commonly used. Use “not commonly” as the word for the blank. Choice (A), *oft*, which means often, is opposite in meaning of the word for the blank. Eliminate it. Choice (B), *rarely*, is a good match. Keep this choice. Choice (C), *frequently*, is opposite in meaning of the word for the blank. Eliminate it. Choice (D), *seldom*, is a good match. Keep this choice. Choice (E), *redundantly*, and Choice (F), *significantly*, are not good matches. Eliminate these choices. The correct answer is (B) and (D).

15. B and E

The blank describes a tradition that lives on. The clue is *permissive society allows more explicit expressions*. The contrasting transition word *although* indicates that the word for the blank is opposite in meaning of the clue. So “implicitness” is a good word for the blank. Choice (A), *rhetoric*, which is the art of using language effectively, is not a good match. Eliminate it. Choice (B), *euphemism*, which means a mild or indirect word substituted for one considered to be too harsh or blunt, is a good match. Keep this choice. Choice (C), *excoriation*, which means a harsh criticism, is not a good match. Eliminate it. Choice (D), *garrulousness*, which means annoyingly talkative, is not a good match. Eliminate it. Choice (E), *genteelism*, which means a word or expression used because it is thought to be socially more acceptable than the everyday word, is a good match. Keep this choice. Choice (F), *pragmatism*, which means practicality, is not a good match. Eliminate it. The correct answer is (B) and (E).

16. A and F

The blank describes the audiences' interest in the movie. The clue is *only after the jejune* (which means uninteresting) *plot twist that their interest began to*. The clue along with the fact that audiences *were rapt during the first half* indicates that audiences' interest began to wane after the plot twist. Use "wane" as the word for the blank. Choice (A), *flag*, which means to lose energy or interest, is a good match. Keep this choice. Choice (B), *wax*, which means to increase in quantity or intensity, is opposite in meaning of the word for the blank. Eliminate it. Choice (C), *swell*, is also opposite in meaning. Eliminate it. Choice (D), *prevaricate*, which means to mislead, is not a good match. Eliminate it. Choice (E), *converge*, is not a good match. Eliminate it. Choice (F), *ebb*, which means to decline or fade away, is a good match. Keep this choice. The correct answer is (A) and (F).

17. C

This is a weaken question as evidenced by the phrase, *most seriously weakens the argument*. Begin by working the argument. The conclusion of the argument is that *severe damage has been inflicted on the American automobile industry by competition from foreign automakers*. The premise is that there has been *a 27% drop in sales of American-made cars in the state of California over the last year*. The argument involves a causal pattern which assumes that competition from foreign automakers caused the 27% drop in sales and that there is no other cause. There is also a sampling pattern which assumes that American-made car sales in the state of California are representative of the entire American automobile industry. To weaken the argument, the credited response will either indicate that there is another cause or demonstrate that California is not representative of the entire American automobile industry. Choice (A) is out of scope because the argument does not address car ownership. Eliminate it. Choice (B) is out of scope because the argument does not address driver *feelings*. Eliminate it. Choice (C) provides another cause and would weaken the argument. If major improvements in public transportation were made in California, then more people probably used public transportation as an alternative to driving, thereby resulting in the decrease in sales. Keep this choice. Choice (D) *strengthens* the argument because it demonstrates that foreign auto companies are the cause of the decrease in sales in the American auto industry. Choice (E) also *strengthens* the argument because it demonstrates that it was solely American-made car sales that decreased significantly in California and not foreign-made car sales. Eliminate it. The correct answer is (C).

18. B

The subject of the question is *Saussure's dismissal of onomatopoeia as a challenge to his theory*. The task is indicated by the phrase *would be most strengthened*. To answer the question, analyze the section of the passage that discusses Saussure's dismissal of onomatopoeia as a challenge to his theory and evaluate the answer choices, eliminating any choice that does not strengthen Saussure's dismissal. The passage claims at the end of the second paragraph, *Saussure dismissed this objection by suggesting that true onomatopoeia, as opposed to that produced by conscious attempts at onomatopoeic pronunciation, is both rare and to some extent socially constructed*. So, the correct answer will support this view. Choice (A) uses the recycled language *conscious attempts, onomatopoeic pronunciation and socially constructed*. Since Saussure's argument concerns *true onomatopoeia*, and not *that produced by conscious attempts*, this choice does not strengthen his argument. Eliminate it. Choice (B) strengthens Saussure's dismissal because it demonstrates that the example is *rare and socially constructed*. Keep this choice. Choice (C) uses the recycled language *grammar, philology, and linguistic disciplines*. Saussure does challenge these disciplines which is the basis for his theory. However, simply mentioning the challenge does not strengthen his argument. Eliminate it. Choice (D) does not strengthen Saussure's objection. He states that *true onomatopoeia...is both rare...* So, he does not agree on the *frequency* of occurrence of onomatopoeic words. However, simply stating that does nothing to further his argument. Eliminate this choice. Choice (E) is incorrect. Saussure's dismissal pertains to *true onomatopoeia* and not words *generally regarded as onomatopoeic*. Eliminate it. The correct answer is (B).

19. *Language was studied first through... between seemingly diverse languages.*

The subject of the question is *a set of methodologies that Saussure finds inadequate*. The task is identified by the phrase *in which sentence does the author present*. To answer the question, identify the sentence in the passage that presents a set of methodologies that Saussure finds inadequate. Label each sentence as a letter and evaluate them one at a time. The first sentence mentions that linguistics was marked by 3 successive approaches but does not present a set of methodologies. Eliminate the first sentence. The second sentence presents a set of methodologies, but doesn't mention Saussure's findings. Keep this choice for now. The third sentence indicates that Saussure considered the linguistic paradigms (mentioned in the second sentence) unsatisfactory. So, it is clear that Saussure finds the set of methodologies mentioned in the second sentence inadequate. Since none of the remaining sentences mentions a set of methodologies that Saussure finds inadequate, the correct answer is the second sentence: *Language was studied first through grammar...between seemingly diverse languages.*

20. D

This is a weaken question as evidenced by the phrase, *would most undermine the argument*. Begin by working the argument. The conclusion of the argument is that *sitting for long periods of time does indeed cause back pain*. The premises is the study which found that *the assistants who spent the most time engaged in sedentary activities were most likely to report frequent back pain*. The argument involves a causal pattern which assumes that sitting for long periods of time resulted in the back pain of these assistants and that there is no other cause. To weaken the argument, the credited response will indicate that there is another cause. Choice (A) *supports* the argument because it rules out regular exercise as a cause of the back pain. Eliminate it. Choice (B) is out of scope. The *severity* of the back pain is irrelevant to the argument. Eliminate it. Choice (C) is also out of scope. The argument pertains to back pain not to *leg pain*. Eliminate it. Choice (D) does provide another factor. If the assistants *over-report* the amount of time they spent sitting, then sitting for long periods of time is not necessarily the cause of the pain. Keep this choice. Choice (E) is out of scope. The argument does not pertain to *job satisfaction*. Eliminate it. The correct answer is (D).

Lesson 8 Verbal

Full Section Verbal Drill Two (page 392)

1. A

The blank describes what the corporate governance prioritizes. The clue is *always seeking new ideas and fostering unique approaches*. So, “novelty” is a good word for the blank. Choice (A), *innovation*, is a good match. Keep this choice. Choice (B), *results*, is not a good match. Eliminate it. Choice (C), *merit*, is not a good match. Eliminate it. Choice (D), *cooperation*, is not a good match. Eliminate it. Choice (E), *stagnation*, is opposite in meaning of the word for the blank. Eliminate it. The correct answer is (A).

2. B

The blank describes Frank Watson’s actions. The clue is *indulgence in all things insalubrious* (unhealthy)...*partook openly in binge drinking and smoking*...*worried that he would die soon*. So, “unhealthy” is a good word for the blank. Choice (A), *vivacious*, which means lively, is not a good match. Eliminate it. Choice (B), *enervating*, which means exhausting or debilitating, is a good match. Keep this choice. Choice (C), *lugubrious*, which means mournful, is not a good match. Eliminate it. Choice (D), *tantalizing*, and choice (E), *firm*, are not good matches. Eliminate them. The correct answer is (B).

3. A and F

This is a two blank text completion question, so begin by working with the easier blank. The first blank seems to be the better starting point. It describes the economist. The clue is *opted not to speak*. So, “shy” is a good word for the first blank. Choice (A), *hermitic*, which means reclusive or solitary, is a good match. Keep this choice. Choice (B), *avaricious*, which means greedy, is not a good match. Eliminate it. Choice (C), *uncooperative*, is not a good match. Eliminate it. Now use the completed first blank to assist in answering the second blank which describes what the economist did regarding many prominent conferences. The semi-colon transition indicates that the first half of the sentence agrees with the second half. The transition *in fact*, further emphasizes the clue which is *does not indicate that she is [hermitic]*. So, a good word for the second blank is “participated in.” Choice (D), *made mention of*, is not a good match. Eliminate it. Choice (E), *lacked faith in*, is not a good match. Eliminate it. Choice (F), *took part in*, is a good match. Keep this choice. The correct answer is (A) and (F).

4. C, F, G

This is a three blank text completion question, so begin with the easiest blank. The second blank seems to be the best starting point. It is a verb that describes the sparrows' initial reaction to the nesting materials. The clue is *these materials were twigs...the twigs were sharp and thorny*. If the twigs were sharp and thorny, then the sparrows probably rejected them at first. So, use "rejected" as the word for the second blank. Choice (D), *desired*, is opposite in meaning of the word for the blank. Eliminate it. Choice (E), *placed*, is not a good match. Eliminate it. Choice (F), *refused*, is a good match. Keep this choice. Now, use the completed second blank to assist in answering the first blank which describes the nesting materials. The clue is the same: *these materials were twigs...the twigs were sharp and thorny*. So, use "sharp and thorny" for the first blank. Choice (A), *substantial*, is not a good match. Eliminate it. Choice (B), *inviting*, is opposite in meaning of the word for the blank. Eliminate it. Choice (C), *spiny*, is a good match. Keep this choice. Now, use the completed first and second blank to assist in answering the third blank which is an adverb that describes the manner in which the sparrows inhabited the nest. The clue is *even then, these did not apparently affect the birds' opinion of the nest*. The word *these* is a reference to the twigs. *Even then*, is a contrasting transition that indicates that despite the twigs, the sparrows inhabited the nest satisfactorily enough. So, use "satisfactorily" as the word for the third blank. Choice (G), *equanimously*, which means in an even-tempered manner, is a good match. Keep this choice. Choice (H), *belatedly*, is not a good match. Eliminate it. Choice (I), *haphazardly*, is not a good match. Eliminate it. The correct answer is (C), (F), (G).

5. A, F, G

This is a three blank text completion question, so begin with the easiest blank. The second blank seems to be the best starting point. It is a verb that describes what happened to the teenager's attitude. The clue is *only the threat of being grounded*. So, only the threat of being grounded "improved" her attitude. Use "improved" as the word for the second blank. Choice (D), *blanched*, which means made pale through sickness or fear, is not a good match. Eliminate it. Choice (E), *paused*, is not a good match. Eliminate it. Choice (F), *ameliorated*, which means to make better, is a good match. Keep this choice. Now, use the completed second blank to assist in answering the first blank which is an adjective that describes the teenager. The clue is *only the threat of being grounded that [ameliorated] her attitude*. So, usually she must be "rebellious." Use "rebellious" as the word for the first blank. Choice (A), *recalcitrant*, which means disobedient, is a good match. Keep this choice. Choice (B), *magnanimous*, which means noble and generous, is opposite in meaning of the word for the blank. Eliminate it. Choice (C), *insipid*, which means dull or uninteresting, is not a good match. Eliminate it. Now, use the completed first and second blank to assist in answering the third blank which is a noun that describes her response to the threat of being grounded. The clue is *implied that it (the threat of being grounded) was very much an undesirable outcome*. Thus, it was her "compliance" regarding that matter that implied that being grounded was very much an undesirable outcome. So, "compliance" is a good word for the third blank. Choice (G), *obsequity*, which means subservience, is a good match. Keep this choice. Choice (H), *celerity*, which means swiftness, is not a good match. Eliminate it. Choice (I), *amity*, which means friendliness, is not a good match. Eliminate it. The correct answer is (A), (F), and (G).

6. B, D, G

This is a three blank text completion question, so begin with the easiest blank. The first blank seems to be the best starting point. It describes what movie studios are wont to do. The clue is *its astonishing that Ascendant Pictures is advertising a slew of movies with brand new intellectual property*. If brand new intellectual property is *astonishing*, then movie studios resist new properties and are wont to avoid change. Use “avoid change” as the phrase for the first blank. Choice (A), *earn profits zealously*, is not a good match. Eliminate it. Choice (B), *make movies conservatively*, is a good match. Keep this choice. Choice (C), *treat their actors differently*, is not a good match. Eliminate it. Now, use the completed first blank to assist in answering the second blank which is verb that describes movie studios willingness regarding novelty. The clue is the same: *its astonishing Ascendant Pictures is advertising a slew of movies with brand new intellectual property*. So, it is a willingness to “try” novelty. Use “try” as the word for the second blank. Choice (D), *embrace*, is a good match. Keep this choice. Choice (E), *abuse*, is not a good match. Eliminate it. Choice (F), *stifle*, is opposite in meaning of the word for the blank. Eliminate it. Now, use the completed first and second blanks to assist in answering the third blank which is a noun that describes the willingness to [embrace] novelty. The clue is *maybe the studio, frequently derided for changing, exploiting, and even ruining franchises, is turning over a new leaf*. So, “refreshing” is a good word for the third blank. Choice (G), *reassuring*, is a good match. Keep this choice. Choice (H), *rote*, which means habitual, is not a good match. Eliminate it. Choice (I), *frustrating*, is not a good match. Eliminate it. The correct answer is (B), (D) and (G).

7. A and B

The subject of the question is the *situations in which cats purred*. The task is indicated by the phrase *according to the passage, which of the following factors were considered from the 1990s to the mid-2000s to influence*. To answer the question, retrieve that information from the passage. *The second sentence of the passage claims that animal psychologists advocated external stimuli for purring such as contentment, either with respect to feeding or being petted...* The third sentence claims that *other reasons considered then included comfort – cats tend to purr when they approach other cats to signal friendliness – and the cat’s perceived lack of security*. So, the factors that influenced the situations in which cats purred were contentment or comfort. Choice (A), *cats’ feelings of danger*, matches *the cat’s perceived lack of security* in the passage. Keep this choice. Choice (B), *comfort*, matches the passage. Keep this choice. Choice (C), *desire to rejuvenate their tissue*, is part of the discussion of Tony Buffington’s findings which are not *factors from the 1990s to the mid-2000s*. Eliminate this choice. The correct answer is (A) and (B).

8. C

The subject of the question is *cats' purring*. The task is indicated by the phrase *it can be inferred from the passage that Buffington and earlier researchers would agree*. To answer this inference question, evaluate the answer choices and determine which is supported by the passage. Choice (A) is not supported by the text. Although Buffington would agree that purring can help to restore weakened bone tissue, since his findings indicated that *the frequencies for tissue stimulation and purring were very similar and are probably linked*, earlier researchers would not. Buffington's findings were part of *subsequent cat research*. So, earlier researchers would not know about these findings. Eliminate this choice. Choice (B) uses the comparison words *is chief among their motivations*. Although the passage mentions *the cat's perceived lack of security* as a reason that cats purr, there is no such comparison in the passage that it is *chief among the motivations*. Eliminate it. Choice (C) is supported by the passage. Earlier researchers identified contentment and comfort as reasons for cats' purring and Buffington focused on internal stimuli which were in addition to external stimuli. Therefore, Buffington and earlier researchers *would agree* that cats' purring can be used *for more than one purpose*. Keep this choice. The correct answer is (C).

9. C

The subject of the question is the *last sentence*. The task is indicated by the phrase *serves which of the following functions*. To answer the question, analyze the passage and determine the purpose of the last sentence. The last sentence claims that *by comparing relative frequencies of purring and tissue stimulation, Buffington found that the frequencies for tissue stimulation and purring were very similar and are probably linked*. So, the last sentence discusses Buffington's findings that support his position on the internal prompts for purring. Choice (A) is incorrect. Although the experiments by Buffington were *dissimilar* to those of earlier researchers, since earlier researchers focused on *external* stimuli and Buffington focused on *internal* stimuli, describing these dissimilarities is not the *function* of the last sentence. Eliminate it. Choice (B) uses the extreme wording *justifies the principles* which is not supported by the passage. Eliminate it. Choice (C) is a paraphrase of the function of the last sentence in the passage. Keep this choice. The correct answer is (C).

10. B

The subject of the question is the passage as a whole. The task is indicated by the phrase *primary purpose*. To answer the question, analyze the passage and determine the reason that the author wrote it. The first sentence of the passage claims that *scientists inspired by miniaturization devised a new metamaterial – an artificial material that is designed to interact with and manipulate light*. The next sentence indicates that *this new material could have potentially earth-shattering ramifications*. The remainder of passage discusses these ramifications which include *manipulate light at incredibly small scales, application to any sort of miniaturized technologies, squeeze and bend light very efficiently with little loss in speed, and help realize quantum computing*. So the primary purpose is to discuss this new material and its ramifications. Choice (A) uses the comparison words *compare several methods of energy*. There is no such comparison of several methods. The passage describes *one* method that the metamaterial allows light to travel unencumbered. Eliminate this choice. Choice (B) is a paraphrase of the purpose of the passage. Keep this choice. Choice (C) uses the extreme wording *underscore limitations* which is a reversal. The passage discusses the *earth-shattering ramifications* not the limitations. Eliminate it. Choice (D) uses the comparison words *widely used*. There is no such comparison regarding the level of use of the technology and this is not the primary purpose of the passage. Choice (E) is a reversal. The passage does not discuss the *process of developing* the new technology. The passage discusses the ramifications of the development. Eliminate it. The correct choice is (B).

11. D

The subject of the question is *one significant implication of the size of the metamaterial*. The task is indicated by the phrase *according to the passage...such a material would*. To answer the question, retrieve that information from the passage and then evaluate the answer choices. The passage claims that *this new material can manipulate light at incredibly small scales, breaking any boundaries that size or scale present. With size no longer an issue, this metamaterial can be applied to any sort of miniaturized technologies, such as microchips*. So, size is no longer an issue. Choice (A) uses the extreme wording *cast doubt on the practicality of quantum computing* which is not supported by the passage. It is a reversal since the passage claims that *while quantum computing is still not a reality, the metamaterial may help realize it...further applications are necessary to determine if quantum computing will indeed work*. Eliminate this choice. Choice (B) is a reversal. Metamaterial does not *assist in shuttling electrons around a circuit*. The passage claims that *instead of electrons shuttling around a circuit, the metamaterial allows light to travel unencumbered*. Eliminate it. Choice (C) uses the comparison words *faster than light speeds* which is not supported. There is no such comparison to the speed of light. The passage states that *the physics of the metamaterial allow it to squeeze and bend light very efficiently with little loss in speed*. Eliminate this choice. Choice (D) is a paraphrase of the information in the passage regarding a significant implication of the size of the metamaterial. Keep this choice. Choice (E) is a reversal. Heat is *not a limiting factor*. The passage claims *without energy being wasted in the system due to heat, many more channels can be opened in even smaller spaces: the metamaterial suffers less resistance and heat*. Eliminate this choice. The correct answer is (D).

12. A and B

The blank describes classics in relation to ancient manuscripts. The clue is *a textually oriented discipline*. So, “interested in” is a good paraphrase for the blank. Choice (A), *focused on*, is a good match. Keep this choice. Choice (B), *occupied by*, is also a good match. Keep this choice. Choice (C), *dismissive of*, is opposite in meaning of the blank. Eliminate it. Choice (D), *pleased by*, is not a good match. Eliminate it. Choice (E), *opposed to*, is also opposite in meaning of the blank. Eliminate it. Choice (F), *apathetic to*, which means uninterested or indifferent, is also opposite in meaning of the blank. Eliminate it. The correct answer is (A) and (B).

13. C and E

The blank describes an assessment of computers. The clue is *people may think that computers are new inventions, but designs for computers actually date back several hundred years*. The contrasting transition word, but, indicates that there is a difference between people's perception of computers and reality. The semi-colon transition indicates that the first half of the sentence agrees with the second half. The clue in the second half is *not that computers exist but that they are used in almost every daily appliance*. So, the second half concerns another difference. Thus, "difference" is a good word for the blank. Choice (A), *benefit*, is not a good match. Eliminate it. Choice (B), *impasse*, which means roadblock, is not a good match. Eliminate it. Choice (C), *divergence*, which means variation, is a good match. Keep this choice. Choice (D), *dilemma*, which is a predicament, is not a good match because of its negative connotation. Choice (E), *distinction*, is a good match. Keep this choice. Choice (F), *trend*, is not a good match. Eliminate it. The correct answer is (C) and (E).

14. C and F

The blank describes Luther's book. The clue is *what seems impossible and filled with literary insights, in an exacting field*. The semi-colon transition indicates that the first half of the sentence agrees with the second half. So, the second half must mean something that seems impossible. The contrasting transition word *however*, indicates that the blank is opposite in meaning of *literary insights* and *an exacting field*. So the book is open to people who are *not experts*. Therefore, use "laypersons" as the word for the blank. Choice (A), *dissenters*, which means objectors or rebels, is not a good match. Eliminate it. Choice (B), *professionals*, is opposite in meaning of the word for the blank. Eliminate it. Choice (C), *novices*, is a good match. Keep this choice. Choice (D), *fanatics*, is not a good match. Eliminate it. Choice (E), *specialists*, is opposite in meaning of the word for the blank. Eliminate it. Choice (F), *dilettantes*, which means dabblers or amateurs, is a good match. Keep this choice. The correct answer is (C) and (F).

15. A and B

The blank describes the criminal lawyer. The clue is *he relied on accurate accounts of events to explain his clients' actions*. Thus, he was no "phoney." So, use "phoney" as the word for the blank. Choice (A), *dissimulator*, and choice (B), *feigner*, both mean a pretender. Since they are both good matches, keep these choices. Choice (C), *champion*, is not a good match. Eliminate it. Choice (D), *shirker*, which means a slacker, is not a good match. Eliminate it. Choice (E), *boaster*, is not a good match. Eliminate it. Choice (F), *blusterer*, which also means a boaster, is not a good match. Eliminate it. The correct answer is (A) and (B).

16. A

This is a weaken question as evidenced by the phrase *most seriously undermines*. Begin by working the argument. The conclusion of the argument is that *the critics were incorrect when they claimed that the streamlining would make the TSA less able to detect any dangerous passengers on airplanes and would thus lead to less safe air travel*. The premise is the statistics that show that *there was an overall decrease in all reports of dangerous passengers and dangerous cargoes that have made it onto airplanes*. The argument involves a causal pattern. The assumption is that there are no other factors that caused the decrease in the reports. To weaken the argument, the credited response will demonstrate that there is an alternate cause. Choice (A) would weaken the argument because it demonstrates that there is an alternate cause for the decrease in all reports of dangerous passengers. Keep this choice. Choice (B) indicates that the statistics provide *the most accurate data on safety travel* which would *strengthen* the argument since it relies on the interpretation of that data. Eliminate it. Choice (C) is out of scope since the argument does not pertain to *other nations*. Eliminate it. Choice (D) is also out of scope since the argument does not pertain to *budgetary gains*. Eliminate it. Choice (E) is also out of scope since the argument does not pertain to the 5 years *prior* to streamlining the TSA. Eliminate it. The correct answer is (A).

17. A

The subject of the question is the passage as a whole. The task is indicated by the phrase *passage is primarily interested in discussing*. To answer the question, analyze the passage and determine the main idea. The first paragraph is a discussion of the *advocates of the land-value tax*. The second paragraph mentions the opposing position by discussing Carnegies' claims. The passage concludes that *no major political party in the United States summoned the political will to actualize its (Progress and Poverty) message*. So the main idea is to discuss the two opposing positions regarding land-value tax. Choice (A) is a paraphrase of the main idea of the passage. Keep this choice. Choice (B) is too narrow. Although, the passage discusses the *potential benefits to labor*, that is not the main idea of the passage. Eliminate it. Choice (C) is too broad. The passage discusses *one cause* of a labor-capital dispute not *causes*. Eliminate it. Choice (D) is too narrow. The main idea is the two opposing positions regarding land-value tax not the *state of the issue*. Eliminate it. Choice (E) is too narrow. The passage is concerned with more than just the *role of labor*. It's also about landowners. Eliminate it. The correct answer is (A).

18. B

The subject of the question is “steel” (line 20). The task is indicated by the phrase *it can be inferred that the author of the passage mentions “steel” primarily to imply that*. To answer this inference question, analyze the passage and determine the reason that the author mentions, “steel.” Then, evaluate the answer choices to determine which is supported by the text. In the second paragraph, the author claims *However, few employers matched Carnegies’ vision in marketing a specific product – steel – that required low barriers to trade...* The previous sentence states that *in contrast to the land-value tax advocates, Andrew Carnegie claims that a complete lack of tariffs provided the greatest impetus for improved output and profits.* So, Carnegies’ position was based on his specific product that required lower tariffs. Choice (A) uses the comparison words *more efficiently* which is not supported by the passage. There is no such comparison of the efficiency of Carnegie’s business to that of other business leaders who desired high tariffs. Eliminate it. Choice (B) uses the comparison words *unlike most other business leaders*. There is no such comparison of Carnegie to *most* other business leaders. Eliminate it. Choice (C) is a paraphrase of the information in the passage for the reasons that the author mentions “steel.” Keep this choice. Choice (D) uses the comparison words *more likely to support*. There is no such comparison of laborers’ support of lower tariffs in sectors of the economy. Eliminate it. Choice (E) is a reversal. In the middle of the second paragraph, the passage states that *few advocates succeeded in adjusting the tariff issue politically.* Therefore, they were *not* successful in bringing about lower tariffs. Eliminate this choice. The correct answer is (C).

19. B

The subject of the question is *claims about the boast referred to in lines 23-24*. The task is indicated by the phrase *it can be inferred that the author of the passage would probably agree*. To answer this inference question, analyze that section of the passage and then determine which answer choice is supported by the text. The passage states that *George's treatise Progress and Poverty, published in 1879, boasted millions of copies sold around the world. Although many people claimed to be influenced by Progress and Poverty between 1879 and 1897, no major political party in the United States summoned the political will to actualize its message*. So, although it sold millions of copies, it did not bring about the change anticipated. Choice (A) uses the extreme language *inflated numbers of interested readers globally in 1897*. There is no indication that the numbers are inflated. Eliminate this choice. Choice (B) is supported by the passage. If millions of copies were sold, the assumption is that its message was followed. This was not the case. Keep this choice. Choice (C) uses the extreme wording *overstates the increase of readers*. The passage only mentions that *millions of copies sold around the world*, it does not provide a breakdown of readership between 1879 and 1897. Eliminate it. Choice (D) uses the extreme wording *exaggerates the formative power of political parties*. This is a reversal. The author admits that no major political party in the United States summoned the political will to actualize its message. Eliminate this choice. Choice (E) used the extreme wording *exaggeration of the number of readers in political parties*. There is no indication that the number of readers is exaggerated and there isn't a breakdown of readers in political parties in the United States specifically. The passage simply states *that millions of copies sold around the world*. Eliminate this choice. The correct answer is (B).

20. B

The subject of the question is *the advocates of the land-value tax who favored abolishing tariffs*. The task is identified by the phrase *according to the passage...claimed that*. To answer the question, retrieve that information from the passage and then evaluate the answer to determine which is supported by the text. The last sentence of the first paragraph claims that *those advocates who wished to advance the land-value tax and abolish tariffs had to make an unpopular case, claiming that the latter punished capital just as much as labor*. So, they claimed that the tariffs had the same effect on capital that it did on labor. Choice (A) is not supported by the passage. There is no discussion of what would *cause an improvement in the equity of wealth* between labor and capital. Eliminate it. Choice (B) is a paraphrase of the information presented in the passage regarding the advocates of the land-value tax who favored abolishing tariffs. Keep this choice. Choice (C) uses the extreme wording *innately abused labor* which is not supported by the passage. Eliminate it. Choice (D) uses the comparison words *less likely*. There is no such comparison of the likelihood of advocates of the land-value tax to advocate lower tariffs to the likelihood of the business leaders to advocate lower tariffs. Eliminate it. Choice (E) uses the comparison words *more helpful*. There is no such comparison of the helpfulness of reducing tariffs to the helpfulness of imposing a land-value tax in raising the standard of living in the laborers. Eliminate it. The correct answer is (B).

Math Practice

Extra Practice Drill (page 420)

1. 125

First, determine the total number of employees in 2010. There are 65 male employees and 80 females. So the total number of employees is $65 + 80 = 145$. Next, translate the question into an equation. The *total number of employees in 2010 was 16 percent greater than in 2009* translates to $145 = \frac{116}{100}x$. Now solve for x which represents the

number of employees in 2009. Thus, $14,500 = 116x$ so $x = 125$. The correct answer is 125.

2. B

Draw the figure and label the information provided.. Notice that the perimeter of the shaded region is the perimeter of triangle ABG . So, determine the lengths of its sides. If the area of square $ACDF$ is 16, and the formula for area of a square is $A = s^2$, then the length of each side of the square is 4. Since $ACDF$ is a square, it has four right angles. Consequently, $BCDE$ is a rectangle. Since opposite sides in a rectangle are equal in length, the length of BE is also 4. If triangle BEG is equilateral, then the length of sides GE and GB is also 4. The degree measures of the angles of an equilateral triangle are 60° . Since $\angle EBC$ has a measure of 90° , $\angle ABE$ also has a measure of 90° . If $\angle GBE$ of equilateral triangle BEG has a degree measure of 60° , then $\angle ABG$ has a measure of 30° . Therefore, triangle ABG is a 30° - 60° - 90° triangle and the ratio of its sides is $x : x\sqrt{3} : 2x$. Since the side opposite the 90 degree angle, GB , has a length of 4, $2x = 4$. Thus, $x = 2$ which is the length of AG , and $x\sqrt{3} = 2\sqrt{3}$ which is the length of AB . Therefore, the perimeter of triangle ABG is $2 + 2\sqrt{3} + 4 = 6 + 2\sqrt{3}$. If $\sqrt{3} \approx 1.7$, then $2\sqrt{3} \approx 3.4$ and Quantity A is $6 + 3.4 = 9.4$. Since Quantity B is greater, the correct answer is (B).

3. A

The goal for this system of equations is to have one variable cancel out. Notice that neither adding nor subtracting the equations results in either variable cancelling out. Since $2x$ is a multiple of x , multiply the second equation by 2. The result is $2x - 4y = 14$. Now subtract the 2nd equation from the first.

$$\begin{array}{r} 2x + 5y = 5 \\ - (2x - 4y = 14) \\ \hline 9y = -9 \end{array}$$

Thus, $y = -1$. Therefore, Quantity B is -1 . Now, Plug In $y = -1$ into one of the equations and solve for x . Using the second equation:

$$\begin{array}{l} x - 2(-1) = 7 \\ x + 2 = 7 \end{array}$$

Thus, $x = 5$. Therefore, Quantity A is 5. Since Quantity A is greater, the correct answer is (A).

4. A

This question involves probability which is $\frac{\# \text{ of possible outcomes that satisfy condition}}{\# \text{ of total possible outcomes}}$

or $\frac{\text{want}}{\text{total}}$. The *total* is selecting 3 pairs of weights from 5 different weight plates. Since

order doesn't matter, it is a combination. So the *total* is $\frac{5 \times 4 \times 3}{3 \times 2 \times 1} = 10$. To determine

the number of possible outcomes that satisfy the condition, first determine the number of pounds that Kyle can bench press. Dan can bench press 315 pounds and Travis can bench press $315 - 20 = 295$ pounds. Since Dan, Travis and Kyle can bench press an average of 280 pounds, use an Average Pie to determine the *Total*. The *# of things* is 3 and the *Average* is 280, so the *Total* is $3 \times 280 = 840$. Therefore, Kyle can bench press $840 - (315 + 295) = 230$ pounds. Since there are 2 pairs of 55 lb. weights, label one 55A and the other 55B. The options for the 3 *pairs* of weight plates plus the 45 pound bar are:

1. $(55A + 55B + 25) \times 2 + 45 = 315$
2. $(55A + 55B + 15) \times 2 + 45 = 295$
3. $(55A + 55B + 10) \times 2 + 45 = 285$
4. $(55A + 25 + 15) \times 2 + 45 = 235$
5. $(55B + 25 + 15) \times 2 + 45 = 235$
6. $(55A + 25 + 10) \times 2 + 45 = 225$
7. $(55B + 25 + 10) \times 2 + 45 = 225$
8. $(55A + 15 + 10) \times 2 + 45 = 205$
9. $(55B + 15 + 10) \times 2 + 45 = 205$
10. $(25 + 15 + 10) \times 2 + 45 = 145$

Since Kyle cannot bench press more than 230 pounds and Travis cannot bench press more than 295 pounds, the options that Dan and Travis can bench press but Kyle cannot are options 2,3, 4 and 5. So the number of options that satisfy the condition is 4.

Therefore, the probability that Dan and Travis can bench press the selected weight but

Kyle cannot is $\frac{4}{10} = \frac{2}{5}$. The correct answer is (A).

5. A

Draw the figure and label the information provided. The formula for the area of a circle is $A = \pi r^2$. If the area of circle O is 25π , then $25\pi = \pi r^2$ and $r = 5$. Draw a line from the right angle to the center, O . That line is a radius of O , so it has length of 5. The line creates an isosceles right triangle with legs of length 5 and hypotenuse z . The ratio of the sides in a 45° - 45° - 90° triangle is $x : x : x\sqrt{2}$. Since $x = 5$, $x\sqrt{2} = 5\sqrt{2} = z$. Thus, Quantity A is $5\sqrt{2}$. If $\sqrt{2} \approx 1.4$, then $5\sqrt{2} \approx 7$. Therefore, Quantity A is greater. The correct answer is (A).

6. 0.375

This is a sequence question, so look for a pattern. Since $A_4 = 10$, Plug In $n = 4$ into the equation and substitute 10 for A_4 . The result is

$$10 = 2A_{4-1} + 1. \text{ Now simplify.}$$

$$9 = 2A_3$$

$$4.5 = A_3$$

Since the question asks for the value of A_1 , substitute the value of A_3 into the equation and solve.

$$4.5 = 2A_2 + 1$$

$$3.5 = 2A_2$$

$$1.75 = A_2$$

Finally, substitute the value of A_2 into the equation and solve for A_1

$$1.75 = 2A_1 + 1$$

$$0.75 = 2A_1$$

$0.375 = A_1$. Therefore, the correct answer is 0.375.

7. 960

This question involves multiple sources: lettuce, vegetables, cheeses, dressings, and croutons. Nicole is only choosing 1 item from each source. There are 4 lettuces, 8 vegetables, 3 cheeses, 5 dressings, and 2 options for croutons (whether or not to have croutons). Therefore, find the product of the sources: $4 \times 8 \times 3 \times 5 \times 2 = 960$. The correct answer is 960.

8. $\frac{20}{12}$ or equivalent fraction

Since there are variables, Plug In. Choose numbers that make the calculations easy, such

as $x = 15$ and $y = 45$. The result is $\frac{\frac{2}{3}(15) + \frac{2}{9}(45)}{\frac{2}{5}(15) + \frac{2}{15}(45)} = \frac{10 + 10}{6 + 6} = \frac{20}{12}$. The correct answer is

$\frac{20}{12}$ or an equivalent fraction. (Fractions don't need to be reduced to lowest terms for numeric entry questions).

9. C

Since there are actual numbers in the answer choices and the question asks, *what is the value*, Plug In the Answer Choices (PITA). Start with answer choice (C), which represents the value of a . Since the value of each term is three times the previous term, the 2nd

term, b , is $\frac{3}{2} \times 3 = \frac{9}{2}$. The 3rd term, c , is then $\frac{9}{2} \times 3 = \frac{27}{2}$. The 4th term, d , is $\frac{27}{2} \times 3 = \frac{81}{2}$.

The question states that $\sqrt{d} = a\sqrt{18}$. So substitute the values for a and d in the equation. Thus,

$$\sqrt{\frac{81}{2}} = \frac{3}{2}\sqrt{18} \text{ Simplify the roots.}$$

$$\frac{\sqrt{81}}{\sqrt{2}} = \frac{3}{2}\sqrt{9 \times 2}$$

$$\frac{9}{\sqrt{2}} = \frac{9}{2}\sqrt{2} \text{ Rationalize the denominator for } \frac{9}{\sqrt{2}}$$

$$\frac{9\sqrt{2}}{2} = \frac{9\sqrt{2}}{2}. \text{ Since } \sqrt{d} = a\sqrt{18}, \text{ the correct answer is (C).}$$

10. B

Draw the figure and label the information provided. The shaded region is half the area of the rectangle and is equal to the area of right triangle ACD . The degree measures of the other 2 angles of triangle ACD are x° and $2x^\circ$. Their sum is 90 degrees. Thus, $3x^\circ = 90^\circ$ and $x^\circ = 30$. Therefore, triangle ACD is a

30° - 60° - 90° triangle and the ratio of its sides is $x : x\sqrt{3} : 2x$. Since the side opposite the 90 degree angle, AC , has a length of 20, $2x$ in the ratio is 20. Thus, the length of CD is $x = 10$ and the length of AD is $x\sqrt{3} = 10\sqrt{3}$. The formula for the area of a triangle is

$$A = \frac{bh}{2} = \frac{10 \times 10\sqrt{3}}{2} = 50\sqrt{3}. \text{ The correct answer is (B).}$$

11. D,E

This question involves overlapping ranges. The answer is a range of values that satisfies both inequalities. To solve, combine the ranges of each inequality by using a grid to account for all the possible values. The first column is for the first variable, j . The second column is for the second variable, k , and the last column is for the operation jk . The least value for j is 4, so that goes in the first two rows of the first column and the greatest value for j is 7, so that goes in the last two rows of the first column. The second column has the least and greatest values of k in alternating rows. The final column is the product of each combination since multiplication is the operation in the question. Here's what the completed grid looks like:

| j | k | jk |
|-----|-----|------|
| 4 | 6 | 24 |
| 4 | 9 | 36 |
| 7 | 6 | 42 |
| 7 | 9 | 63 |

For all possible values of jk , analyze the last column and choose the least value which is 24, and the greatest value which is 63. So the complete range of jk is $24 \leq jk \leq 63$. The value of jk can be any number that falls within that range. Of the answer choices, only 24 and 48 fall within that range. The correct answer is (D) and (E).

12. A

According to the table, Company X spent 32% of \$210,000 on print advertising in 2006. $32\%(210,000) = 67,200$. Half was spent on newspaper advertisements, which is

$$\frac{67,200}{2} = 33,600. \text{ Since } \frac{3}{4} \text{ of the remainder was spent on flyers, that is}$$

$$\frac{3}{4} \times 33,600 = 25,200. \text{ To determine how many more thousands of dollars was spent on newspaper advertisements than on flyers, calculate the difference.}$$

$$33,600 - 25,200 = 8,400 \text{ which is 8.4. The correct answer is (A).}$$

13. D

Use prime factorization to find the prime factors of 15^{15} . The prime factorization of $15^{15} = 3^{15} \times 5^{15}$. Now check the answer choices to determine which is NOT a factor of 15^{15} . For choice (A), 3 is clearly a factor. So eliminate it. For choice (B), $9 = 3^2$, so it is also a factor. Eliminate it. For choice (C), $135 = 3 \times 3 \times 3 \times 5$, so it is also a factor. Eliminate it. Choice (D), $180 = 2 \times 2 \times 3 \times 3 \times 5$. Since 2 is not a factor of 15^{15} , 180 is NOT a factor. The correct answer is (D). Alternatively, notice that 15^{15} is an odd number. Odd numbers do not have even factors. Therefore, 180, which is an even number, is NOT a factor of 15^{15} . The correct answer is (D).

14. 4,731

Translate the first sentence in the question into an equation. $\frac{40}{100}x = 1,992$. Now, solve

for x . $40x = 199,200$. So, $x = 4,980$. Next, translate the second sentence in the question into an equation. $\frac{95}{100} \times 4,980 = 4,731$. The correct answer is 4,731.

15. A

Since there are no variables in this Quant Comp Question, eliminate answer choice (D). The question states that n is an even integer. Normally, the next step is to Plug In. Based on the question restriction, the minimum value of n is 6. Rather than calculate the result of that exponent, notice that Quantity A is a negative number raised to an even power. Therefore, regardless of the value of n , the result is a positive number. Regardless of the value of n , Quantity B is *always* negative because the negative sign is outside the parentheses. Since Quantity A is positive and Quantity B is negative, Quantity A is greater. The correct answer is (A).

16. D

Since there are variables in the answer choices, Plug In. Use easy numbers such as $b = 2$ and $d = 4$. Thus, $\frac{2 \text{ books}}{4 \text{ dollars}} = \frac{7 \text{ books}}{x \text{ dollars}}$. Now solve for x . So, $2x = 28$ and $x = 14$. That is the

target answer, so circle it and check the answer choices. Choice (A) is $\frac{7 \times 2}{4} = \frac{7}{2}$ which does not match the target, so eliminate it. Choice (B) is $7 \times 4 \times 2 = 56$. Eliminate it.

Choice (C) is $\frac{2}{7 \times 4} = \frac{1}{14}$. Eliminate it. Choice (D) is $\frac{7 \times 4}{2} = 14$ which matches the target.

So keep choice (D) and check the remaining choice. Choice (E) is $\frac{4}{7 \times 2} = \frac{2}{7}$. Eliminate it.

The correct answer is (D).

17. D

This is a Quant Comp Question with variables, so Plug In. First, Plug In an easy number such as $k = 2$. So Quantity A is $\frac{5}{5+3^2} = \frac{5}{5+9} = \frac{5}{16}$. Quantity B is $\frac{5}{5+7^2} = \frac{5}{5+49} = \frac{5}{54}$.

Since Quantity A is greater, eliminate answer choices (B) and (C). Now, Plug In again using FROZEN. Try Zero. If $k = 0$, then Quantity A is $\frac{5}{5+3^0} = \frac{5}{5+1} = \frac{5}{6}$ and Quantity B is

$\frac{5}{5+7^0} = \frac{5}{5+1} = \frac{5}{6}$. Now the two quantities are equal, so eliminate choice (A). The correct answer is (D).

18. A

Since there are actual numbers in the answer choices and the question asks, *what is the total amount*, Plug In the Answer Choices (PITA). Start with answer choice (C), which represents the total amount of the prize. If the total amount of the prize is \$20,000,000 and 40% is paid in taxes, the amount remaining after taxes is $0.6(20,000,000) = 12,000,000$. If the proceeds after taxes are divided equally amongst the 5 coworkers, then they each receive $\frac{12,000,000}{5} = 2,400,000$. Since the amount is greater than

\$1,800,000 listed in the problem, eliminate answer choice (C), as well as choices (D) and (E). Now try a lesser value for the total amount of money, such as \$15,000,000 in choice (A). The amount remaining after taxes is $0.6(15,000,000) = 9,000,000$. Each coworker receives $\frac{9,000,000}{5} = 1,800,000$ which matches the question. The correct answer is (A).

19. B,F

This is a *must be* question, so Plug In more than once. Plug In a value for x that satisfies the question conditions, such as $x = \frac{1}{2}$. Now check the answer choices and eliminate

any expression that is less than $\frac{1}{2}$. Choice (A) is $\left(\frac{1}{2}\right)^2 = \frac{1}{4}$. Eliminate it. Choice (B) is

$2 \times \frac{1}{2} = \frac{2}{2} = 1$. So keep this choice for now and continue checking the remaining answer

choices. Choice (C) is $1 - \frac{1}{4} = \frac{3}{4}$. So keep this choice for now. Choice (D) is

$1 - 2\left(\frac{1}{2}\right) = 1 - 1 = 0$. Eliminate it. Choice (E) is $\frac{1}{4} - 2 = -\frac{7}{4}$. Eliminate it. Choice (F) is

$2 - \frac{1}{4} = \frac{7}{4}$. So keep this choice for now. Now Plug In again using FROZEN. Try an

extreme value that is closer to one of the endpoints of the ranges such as $x = \frac{3}{4}$. Now

choice (B) is $2 \times \frac{3}{4} = \frac{6}{4} = \frac{3}{2}$. So keep this choice. Choice (C) is $1 - \left(\frac{3}{4}\right)^2 = 1 - \frac{9}{16} = \frac{7}{16}$.

Since $\frac{7}{16} < \frac{3}{2}$, eliminate choice (C). Choice (F) is $2 - \frac{9}{16} = \frac{23}{16}$. So keep this choice.

Regardless of the value of x , since $0 < x < 1$, choice (B) is always greater than x because it is doubling x . Choice (F) is always greater than x since subtracting x^2 from 2 results in a value greater than 1. The correct answer is (B) and (F).

20. B

Since the question refers to *two groups* (Energy Star certified water heaters and water heaters eligible for a federal tax rebate), *neither* and *both*, this is a group problem. Use the group formula to solve the problem. Total = Group 1 + Group 2 – Both + Neither.

Plug In the numbers from the question into the formula. In this case, since Group 2 is 3 times the number that is neither (N), use $3N$ for Group 2. The result is:

$$20 = 14 + 3N - 10 + N$$

$$20 = 4 + 4N$$

$$16 = 4N$$

$$4 = N$$

$$12 = 3N$$

Therefore, the number of water heaters that is eligible for the federal tax rebate is 12. The correct answer is (B).

21. 8

Since this question involves four groups: Paleolithic, Neolithic, Mediterranean and Non-Mediterranean, draw a grid and fill in the information from the question. Circle the box that the question is being solved for to avoid unnecessary calculations.

| | Paleolithic | Neolithic | Total |
|-------------------|-------------|-----------|-------|
| Mediterranean | | | 26 |
| Non-Mediterranean | | 16 | |
| Total | | 16 | |

If $\frac{3}{5}$ of the artifacts are Paleolithic and the remaining 16 are Neolithic, then Neolithic

artifacts are $\frac{2}{5}$ of the total. Determine the total number of artifacts by using the

following equation. $16 = \frac{2}{5}x$. Clear the fraction. $80 = 2x$ and $x = 40$. So the total number of artifacts is 40. That means that there are $40 - 26 = 14$ Non-Mediterranean artifacts and $40 - 16 = 24$ Paleolithic artifacts. If $\frac{3}{4}$ of the Paleolithic artifacts are Mediterranean,

then there are $\frac{3}{4} \times 24 = 18$ Mediterranean Paleolithic artifacts. $24 - 18 = 6$ Non-

Mediterranean Paleolithic artifacts. $14 - 6 = 8$ Non-Mediterranean Neolithic artifacts.

The correct answer is 8. The completed grid should resemble this.

| | Paleolithic | Neolithic | Total |
|-------------------|-------------|-----------|-------|
| Mediterranean | 18 | | 26 |
| Non-Mediterranean | 6 | 8 | 14 |
| Total | 24 | 16 | 40 |

22. A,F

Since the sum of the degree measures of two adjacent angles on a line is 180° , the degree measure of $\angle BAD$ is $180 - 135 = 45$. So, select answer choice (A). Opposite angles in a parallelogram are congruent (have the same measure). Thus, the degree measure of $\angle BCD$ is also 45° . Since consecutive angles in a parallelogram are supplementary (the sum of the measures of the two angles is 180°), the measure of $\angle ABC$ is $180 - 45 = 135$. So, select choice (F). If the measure of $\angle ABC$ is 135° , then the measure of $\angle ADC$ is also 135° . Therefore, the only two possibilities of a degree measurement of an angle within parallelogram $ABCD$ is 45° and 135° . The correct answer is (A) and (F).

23. B

Draw the figure and label the information provided. The formula for the area of parallelogram is $A = bh$. Opposite sides in a parallelogram are congruent (have the same measure). If the length of BC is 8, then the length of AD is also 8. So, the base has a length of 8. Now determine the length of the height, which is perpendicular to the base. Draw a vertical line from point C perpendicular to the base AD , thereby creating a right triangle. The hypotenuse of the triangle, CD , has a length of $4\sqrt{2}$. Consecutive angles in a parallelogram are supplementary (the sum of the measures of the two angles is 180°). Thus, the degree measurement of $\angle BCD$ plus the degree measurement of $\angle CDA$ is 180° . Since the degree measurement of $\angle BCD$ is three times the degree measurement of $\angle CDA$, $3x + x = 180$ or $4x = 180$ and $x = 45$. So, $\angle CDA$ has a degree measurement of 45° . Therefore, the right triangle is a 45° - 45° - 90° triangle with sides in the ratio of $x : x : x\sqrt{2}$. Since the length of the side opposite the right angle, CD , has a measure of $4\sqrt{2}$, $x\sqrt{2} = 4\sqrt{2}$ and $x = 4$. Therefore, the measure of the height of the parallelogram is 4. The area is then $A = bh = 8 \times 4 = 32$. The correct answer is (B).

24. 12

The formula for the area of a circle is $A = \pi r^2$. If the area of circle O is $\frac{36}{\pi}$, then $\pi r^2 = \frac{36}{\pi}$. Next, clear the fraction. $\pi^2 r^2 = 36$. Now, solve for the radius. $r = \frac{6}{\pi}$. The formula for the circumference of a circle is $C = 2\pi r$. Therefore, $C = 2\pi \left(\frac{6}{\pi}\right) = 12$. The correct answer is 12.

25. D

Draw the figure and label the information provided. The formula for the area of a circle is $A = \pi r^2$. If the area of the circular region is 4π , then $4\pi = \pi r^2$. Thus, $4 = r^2$ and $2 = r$. When a question involves overlapping figures, determine what the two figures have in common. In this case, the diameter of the circle is also the diagonal of the square. Draw the diagonal. If the radius of the circle is 2, then its diameter is 4 and the diagonal of the square is also 4. The diagonal of the square creates two 45° - 45° - 90° triangles with sides in the ratio of $x : x : x\sqrt{2}$. If the diagonal is 4, then the hypotenuse of the right triangle is also 4, so $x\sqrt{2} = 4$. Thus, the side x (or in this case, s) is $\frac{4}{\sqrt{2}}$. The formula for the area of a square is $A = s^2$. Therefore, $A = \left(\frac{4}{\sqrt{2}}\right)^2 = \frac{16}{2} = 8$. The correct answer is (D).

26. D

The question asks for the distance between two points, S and R . So, draw a right triangle. The height, the distance from point R to the base, is 5. The coordinates of the point where the height meets the base are $(20, 0)$. Determine the coordinates of point S to calculate the length of the base. Notice that point S is the x -intercept, the point in which the line crosses the x -axis. At that point, $y = 0$. So Plug In $y = 0$ into the equation of the line and solve for x .

$$0 = -\frac{5}{4}x + 10$$

$$-10 = -\frac{5}{4}x. \text{ Clear the fraction.}$$

$$-40 = -5x \text{ Solve for } x.$$

$$8 = x$$

Thus, the coordinates of point S are $(8, 0)$. So the length of the base of the triangle is $20 - 8 = 12$. Recognize the Pythagorean Triple 5-12-13. Therefore, the length of the hypotenuse, SR , is 13. The correct answer is (D).

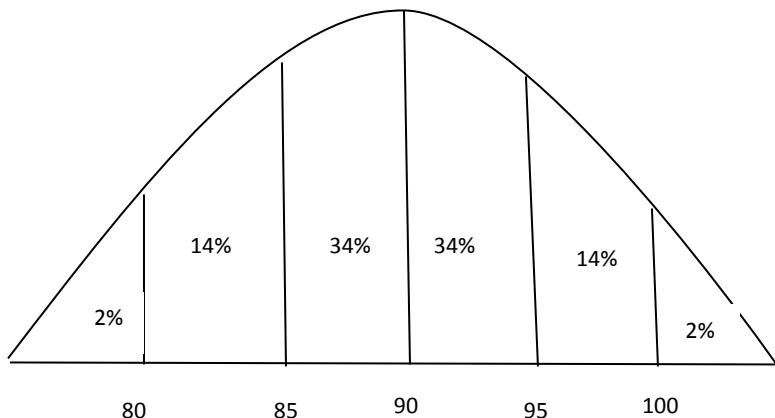
27. D

To solve this factorial problem, start by factoring the numerator. $12!$ and $11!$ have $11!$ in common, so factor out $11!$ Thus, $\frac{12!+11!}{10!} = \frac{11!(12+1)}{10!}$. Now simplify.

$$\frac{11!(12+1)}{10!} = \frac{11!(13)}{10!} = 11 \times 13 = 143. \text{ The correct answer is (D).}$$

28. A, C

Draw a normal distribution with an average of 90 and a standard deviation of 5 and include the approximate percents of the distribution corresponding to the six regions as shown below.



Now evaluate the answer choices to determine which are true. For choice (A), between 95 and 100 hours of television is approximately 14% of the distribution. $14\% \text{ of } 130,000 = 18,200$. Therefore, the statement is true, so select choice (A). For choice (B), between 80 and 85 hours of television is approximately 14% of the distribution which is *not* more than 25%. Therefore, this statement is false, so eliminate choice (B). For choice (C), fewer than 80 hours of television is approximately 2% of the distribution. $2\% \text{ of } 130,000 = 2,600$. Therefore, the statement is true, so select choice (C). The correct answer is (A) and (C).

29. $\frac{40}{125}$ or equivalent fraction

This question involves probability which is $\frac{\# \text{ of possible outcomes that satisfy condition}}{\# \text{ of total possible outcomes}}$

or $\frac{want}{total}$. In this case, *want* is the number of partygoers who arrive late and *total* is the

number of attendees which is 125 people. Therefore, $\frac{\text{want}}{\text{total}} = \frac{\text{late}}{125}$. Now determine the

number of partygoers that arrive late. If $\frac{1}{5}$ of the male partygoers arrive late and there

are 75 males, then $\frac{1}{5} \times 75 = 15$ male partygoers arrive late. Since there are 125

attendees and 75 are male, there are $125 - 75 = 50$ female partygoers. If $\frac{1}{2}$ of them

arrive late, then 25 female partygoers arrive late. Therefore the number of partygoers who arrive late is $15 + 25 = 40$. The probability that the prize will be won by a partygoer

who arrives late is $\frac{40}{125}$ which is the correct answer (or an equivalent fraction since

fractions don't need to be reduced to lowest terms for numeric entry questions).

30, C

Since the question has the phrase *at least*, it is easier to find the probability that *none* of the students will answer the problem correctly. The formula is $P(A) = 1 - P(\text{not } A)$. The

probability that Mark does *not* answer the problem correctly is $\frac{3}{4}$, that Peter does *not*

answer correctly is $\frac{3}{5}$, and that Wanda does *not* answer correctly is $\frac{5}{8}$. So, the

probability that *none* of them answers the problem correctly is $\frac{3}{4} \times \frac{3}{5} \times \frac{5}{8} = \frac{9}{32}$.

Therefore, the probability *at least* one of the students answers the problem correctly is

$1 - \frac{9}{32} = \frac{23}{32}$. The correct answer is (C).

31. C

Since the question references the number of *different arrangements*, order matters.

$(a,b,c) \neq (c,b,a)$. The question involves selecting multiple items from one source

(photos). Since the grandmother can only fit four photos, there are 4 spots. For the 1st photo, there are 11 possibilities. For the 2nd photo, there are 10 possibilities (since one photo has already been chosen).

spot, there are 11 possible photos. For the 2nd spot, there are 10 possible photos (since one was used for the 1st spot). For the 3rd spot, there are 9 photos and for the 4th spot,

there are 8. Therefore, $11 \times 10 \times 9 \times 8 = 7,920$ different arrangement. The correct

32. B

If each team plays each of the other teams in the county exactly once that is the same as asking how many different ways there are to choose 2 teams out of 9 possible teams.

So, it's a combination and order doesn't matter. Therefore there are $\frac{9 \times 8}{2 \times 1} = 36$ games

played *within* the county. If each team also plays 2 games against schools from a neighboring county, then there are $9 \times 2 = 18$ additional games. Therefore, the total number of games played is $36 + 18 = 54$. The correct answer is (B).