Graduate **Management** **Admission** **Council**®

Educational **Testing Service**

Graduate Management Admission Test® (GMAT®)

Disclosed Edition

Test Code 48

ABOUT THIS EDITION OF THE GMAT®

This booklet contains the questions that were used to derive scores on the edition of the Graduate Management Admission Test (GMAT®) with test code 48. If the first two digits of the test code on your answer sheet (item 5 on Side 1) are not 48, please contact ETS to send you the correct booklet to match your answer sheet. The answer key follows the test questions. This booklet also contains instructions for calculating raw scores corrected for guessing. These are followed by unique tables for converting raw scores to the reported scaled scores for test code 48.

In this edition of the GMAT, the following essay and multiple-choice sections contributed to your scores:

Analytical Writing Assessment

Essay 1	Analysis of an Issue
Essay 2	Analysis of an Argument

Verbal Assessment

Section 1	Sentence Correction
Section 4	Critical Reasoning
Section 6	Reading Comprehension

Quantitative Assessment

Section 3	Problem Solving
Section 5	Data Sufficiency
Section 7	Problem Solving

GMAT Total

All six verbal and quantitative sections combined as one score

Section 2 in this edition of the GMAT contained trial or equating questions and does not contribute to your score. Questions from this section are not included in this booklet.

Analytical Writing 1

ANALYSIS OF AN ISSUE

Time—30 minutes

<u>Directions:</u> In this section, you will need to analyze the issue presented below and explain your views on it. The question has no "correct" answer. Instead, you should consider various perspectives as you develop your own position on the issue.

Read the statement and the instructions that follow it, and then make any notes in your test booklet that will help you plan your response. Begin writing your response on the separate answer sheet. Make sure that you use the answer sheet that goes with this writing task.

"Employees should keep their private lives and personal activities as separate as possible from the workplace."

Discuss the extent to which you agree or disagree with the opinion stated above. Support your views with reasons and/or examples from your own experience, observations, or reading.

NOTES

Use the space below or on the facing page to plan your response. Any writing on these pages will not be evaluated.

S T O P
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Analytical Writing 2

ANALYSIS OF AN ARGUMENT

Time—30 minutes

<u>Directions:</u> In this section, you will be asked to write a critique of the argument presented below. *You are NOT being asked to present your own views on the subject.*

Read the argument and the instructions that follow it, and then make any notes in your test booklet that will help you plan your response. Begin writing your response on the separate answer sheet. Make sure that you use the answer sheet that goes with this writing task.

The following appeared as part of a recommendation by one of the directors of the Beta Company.

"The Alpha Company has just reduced its workforce by laying off fifteen percent of its employees in all divisions and at all levels, and it is encouraging early retirement for other employees. As you know, the Beta Company manufactures some products similar to Alpha's, but our profits have fallen over the last few years. To improve Beta's competitive position, we should try to hire a significant number of Alpha's former workers, since these experienced workers can provide valuable information about Alpha's successful methods, will require little training, and will be particularly motivated to compete against Alpha."

Discuss how well reasoned you find this argument. In your discussion be sure to analyze the line of reasoning and the use of evidence in the argument. For example, you may need to consider what questionable assumptions underlie the thinking and what alternative explanations or counterexamples might weaken the conclusion. You can also discuss what sort of evidence would strengthen or refute the argument, what changes in the argument would make it more logically sound, and what, if anything, would help you better evaluate its conclusion.

NOTES

Use the space below or on the facing page to plan your response. Any writing on these pages will not he evaluated.

S T O P
IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS SECTION ONLY.
DO NOT TURN TO ANY OTHER SECTION IN THE TEST

ANSWER SHEET – Test Code 48

Section 1	Section 3	Section 4	Section 5	Section 6	Section 7
1.	1.	1.	1.	1.	1.
2.	2.	2.	2.	2.	2.
3.	3.	3.	3.	3.	3.
4.	4.	4.	4.	4.	4.
5.	5.	5.	5.	5.	5.
6.	6.	6.	6.	6.	6.
7.	7.	7.	7.	7.	7.
8.	8.	8.	8.	8.	8.
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10.	10.	10.	10.	10.	10.
11.	11.	11.	11.	11.	11.
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13.	13.	13.	13.	13.	13.
14.	14.	14.	14.	14.	14.
15.	15.	15.	15.	15.	15.
16.	16.	16.	16.	16.	16.
17.				17.	17.
18.				18.	18.
19.					19.
20.					20.
21.					
22.					

SECTION 1
Time—25 minutes
22 Questions

<u>Directions</u>: In each of the following sentences, some part of the sentence or the entire sentence is underlined. Beneath each sentence you will find five ways of phrasing the underlined part. The first of these repeats the original; the other four are different. If you think the original is the best of these answer choices, choose answer A; otherwise, choose one of the others. Select the best version and fill in the corresponding oval on your answer sheet.

This is a test of correctness and effectiveness of expression. In choosing answers, follow the requirements of standard written English; that is, pay attention to grammar, choice of words, and sentence construction. Choose the answer that produces the most effective sentence; this answer should be clear and exact, without awkwardness, ambiguity, redundancy, or grammatical error.

1.   The black hole has entered the popular imagination as an object <u>too massive that neither light nor matter can escape its</u> gravitational pull.

(A) too massive that neither light nor matter can escape its

(B) too massive for either allowing light or matter to escape its

(C) massive enough that either light or matter cannot escape their

(D) so massive that neither light nor matter could escape their

(E) so massive that neither light nor matter can escape its

2.   <u>After crude oil, natural gas is the United States' second biggest fuel source and supplied almost exclusively from reserves in North America.</u>

(A) After crude oil, natural gas is the United States' second biggest fuel source and supplied almost exclusively from reserves in North America.

(B) Natural gas, after crude oil the United States' second biggest fuel source, supplied almost exclusively from reserves in North America.

(C) Being supplied almost exclusively from reserves in North America, natural gas, the United States' second biggest fuel source after crude oil.

(D) Natural gas, the United States' second biggest fuel source after crude oil, is supplied almost exclusively from reserves in North America.

(E) Natural gas is supplied almost exclusively from reserves in North America, being the United States' second biggest fuel source after crude oil.

3.   The airline industry is cutting its lowest discount fares more widely, more substantially, and earlier this year than it normally does at the end of the summer, a time <u>during which travel usually decreases and the industry uses some lower fares for the attraction of</u> passengers.

(A) during which travel usually decreases and the industry uses some lower fares for the attraction of

(B) during which travel usually decreases and therefore the industry will use some lower fares for the attraction of

(C) in which travel usually decreases and in which the industry therefore uses some lower fares attracting

(D) when travel usually decreases and the industry uses some lower fares to attract

(E) when travel usually decreases and therefore the industry will use lower fares for the attraction of

4.   The aristocratic values expressed in the writings of MargueriteYourcenar place her within the French classical tradition, <u>as does</u> her passionate interest in history, particularly Roman history.

(A) as does

(B) so do

(C) as do

(D) so is the case with

(E) similarly, does

GO ON TO THE NEXT PAGE.

5.   Selling several hundred thousand copies in six months, the publication of "Maple Leaf Rag" in 1899 was an instant hit, helping to establish Scott Joplin as the preeminent ragtime composer.

(A) Selling several hundred thousand copies in six months, the publication of "Maple Leaf Rag" in 1899 was an instant hit, helping to establish Scott Joplin as the preeminent ragtime composer.

(B) The publication in 1899 of "Maple Leaf Rag" was an instant hit; in six months they sold several hundred thousand copies and it helped establish Scott Joplin as the preeminent ragtime composer.

(C) Helping to establish Scott Joplin as the preeminent ragtime composer was the publication of "Maple Leaf Rag" in 1899, which was an instant hit; it sold several hundred thousand copies in six months.

(D) "Maple Leaf Rag" was an instant hit; it helped establish Scott Joplin as the preeminent ragtime composer, published in 1899 and selling several hundred thousand copies in six months.

(E) Published in 1899, "Maple Leaf Rag" was an instant hit, selling several hundred thousand copies in six months; it helped establish Scott Joplin as the preeminent ragtime composer.

6.   Because paper of all kinds is the biggest single component of municipal trash, many municipalities have tried recycling to reduce the cost of trash disposal.

(A) Because paper of all kinds is the biggest single component of municipal trash, many municipalities have tried recycling to reduce the cost of trash disposal.

(B) Because paper of all kinds is the biggest single component in municipal trash, many municipalities tried to recycle so that the cost of trash disposal is reduced.

(C) Because paper of all kinds are the biggest single components of municipal trash, many municipalities have tried to recycle to reduce the cost of trash disposal.

(D) All kinds of paper are the biggest single components of municipal trash, and so many municipalities have tried recycling to reduce the cost of trash disposal.

(E) All kinds of paper is the biggest single component of municipal trash, so many municipalities have tried to recycle so that the cost of trash disposal could be reduced.

7.   As rare as something becomes, be it a baseball card or a musical recording or a postage stamp, the more avidly it is sought by collectors.

(A) As rare as something becomes, be it

(B) As rare as something becomes, whether it is

(C) As something becomes rarer and rarer, like

(D) The rarer something becomes, like

(E) The rarer something becomes, whether it is

8.   Psychologists now contend that the way adults think and feel are determined as much by their peers in early childhood than by their parents.

(A) are determined as much by their peers in early childhood than by their

(B) are determined as much by peers in early childhood as do their

(C) is determined as much by their early childhood peers as by their

(D) have been determined by childhood peers as much as their

(E) was determined as much by one's peers in childhood as by one's

9.   Migraine, the most debilitating common form of headache, afflicts perhaps 18 million Americans, who collectively lose 64 million workdays a year, and they cost the nation $50 billion in medical expenses and lost work time.

(A) year, and they cost the nation $50 billion in medical expenses and lost

(B) year and thus cost the nation $50 billion in medical expenses and lost

(C) year, so as to cost the nation $50 billion in medical expenses and lost

(D) year that costs the nation $50 billion in lost medical expenses and

(E) year, which thus cost the nation $50 billion in lost medical expenses and

GO ON TO THE NEXT PAGE.

10. <u>Like many others of his generation of Native American leaders, Joseph Brant lived in two worlds;</u> born into an Iroquois community and instructed in traditional Iroquois ways, he also received an education from English-speaking teachers.

    (A) Like many others of his generation of Native American leaders, Joseph Brant lived in two worlds;

    (B) Like many others of his generation of Native American leaders, living in two worlds, Joseph Brant was

    (C) Like many another of his generation of Native American leaders, Joseph Brant, living in two worlds, was

    (D) As with many others of his generation of Native American leaders, living in two worlds, Joseph Brant was

    (E) As with many another of his generation of Native American leaders, Joseph Brant lived in two worlds;

11. Sales of United States manufactured goods to nonindustrialized countries rose to $167 billion in 1992, <u>which is 14 percent more than the previous year</u> and largely offsets weak demand from Europe and Japan.

    (A) which is 14 percent more than the previous year

    (B) which is 14 percent higher than it was the previous year

    (C) 14 percent higher than the previous year's figure

    (D) an amount that is 14 percent more than the previous year was

    (E) an amount that is 14 percent higher than the previous year's figure

12. All-terrain vehicles have allowed vacationers to reach many previously inaccessible areas, but they have also been blamed for causing hundreds of <u>deaths, injury to thousands, and seriously damaging</u> the nation's recreational areas.

    (A) deaths, injury to thousands, and seriously damaging

    (B) deaths and injuring thousands, and serious damage to

    (C) deaths, thousands who are injured, as well as seriously damaging

    (D) deaths and thousands of injuries, as well as doing serious damage to

    (E) deaths, thousands are injured, and they do serious damage to

13. <u>Foreign investors, because of their growing confidence in their capability for making profitable investments in the United States, have been led</u> to move from passive involvement in commercial real estate partnerships to active development of their own increasingly ambitious projects.

    (A) Foreign investors, because of their growing confidence in their capability for making profitable investments in the United States, have been led

    (B) Foreign investors, growing confident about their capability for making profitable investments in the United States, has led them

    (C) Growing confidence in their ability to make profitable investments in the United States has led foreign investors

    (D) Growing confidence in their ability for making profitable investments in the United States have led foreign investors

    (E) Growing confident about their capabilities for making profitable investments in the United States, foreign investors have been led

14. Local residents claim that San Antonio, Texas, has more good Mexican American restaurants than <u>any city does</u> in the United States.

    (A) any city does

    (B) does any other city

    (C) other cities do

    (D) any city

    (E) other cities

15. <u>If the new airboat does what it is to be doing</u> – travel at high speeds undeterred by sandbars, crocodile-infested mudflats, or marshy hippo haunts – it could revolutionize transport on the 2,900-mile-long Congo River.

    (A) If the new airboat does what it is to be doing

    (B) If the new airboat does what it is supposed to do

    (C) If it does as the new airboat is supposed to do

    (D) Doing what it is the new airboat is supposed to do

    (E) Doing what the new airboat is to be doing

GO ON TO THE NEXT PAGE.

16. The company is negotiating to sell its profitable credit card <u>subsidiary, which it plans to use money from</u> to acquire some of the mortgage-servicing operations that are being sold by troubled savings institutions.

(A) subsidiary, which it plans to use money from

(B) subsidiary, from which it plans to use money

(C) subsidiary, and it plans the use of money from that

(D) subsidiary and plans to use money from that sale

(E) subsidiary and plans the use of money from that sale

17. In the 1980's the rate of increase of the minority population of the United States was nearly <u>twice as fast as</u> the 1970's.

(A) twice as fast as

(B) twice as fast as it was in

(C) twice what it was in

(D) two times faster than that of

(E) two times greater than

18. The figure of the jaguar, <u>being a recurrent symbol within</u> Olmec art, is prominent among the hieroglyphics inscribed on a monument that was discovered in the Mexican state of Veracruz.

(A) being a recurrent symbol within

(B) a symbol having recurred within

(C) a recurring symbol in

(D) having been a symbol that recurred in

(E) recurring as it is, a symbol in

19. As the etched lines on computer memory chips have become thinner and the <u>chips' circuits more complex, both the power of the chips and the electronic devices they drive have</u> vastly increased.

(A) the chips' circuits more complex, both the power of the chips and the electronic devices they drive have

(B) the chips' circuits more complex, the power of both the chips and the electronic devices they drive has

(C) the chips' circuits are more complex, both the power of the chips and the electronic devices they drive has

(D) their circuits are more complex, the power of both the chips and the electronic devices they drive have

(E) their circuits more complex, both the power of the chips and the electronic devices they drive have

20. Since savings banks have to use short-term deposits to finance long-term fixed-rate mortgage loans, they sometimes lose money <u>when there is a rise in short-term rates and, on the other hand, they are unable to raise</u> the rates on their mortgages.

(A) when there is a rise in short-term rates and, on the other hand, they are unable to raise

(B) when short-term rates rise and they are unable to raise

(C) when a rise in short-term rates occurs and, correspondingly, there is no rise possible in

(D) with a rise in short-term rates, and they are unable to raise

(E) with short-term rates on the rise and no rise possible in

21. St. John's, Newfoundland, lies on the same latitude as Paris, France, but in spring St. John's <u>residents are less likely to be sitting at outdoor cafes than to be bracing themselves against arctic chills, shoveling snow, or seeking</u> shelter from a raging northeast storm.

(A) residents are less likely to be sitting at outdoor cafes than to be bracing themselves against arctic chills, shoveling snow, or seeking

(B) residents are less likely to sit at outdoor cafes, and more to be brace themselves against arctic chills, shovel snow, or be seeking

(C) residents are less likely to be sitting at outdoor cafes, and more likely to be bracing themselves against arctic chills, shoveling snow, or to be seeking

(D) residents, instead of sitting at outdoor cafes, they are more likely to be brace themselves against arctic chills, shovel snow, or seek

(E) residents, instead of sitting at outdoor cafes, are more likely to brace themselves against arctic chills, shovel snow, or to be seeking

22. Unlike other arachnids, which have their nerve cells evenly distributed along their <u>bodies, the scorpion's nerve cells are clustered in its head, like a mammal's</u>.

(A) bodies, the scorpion's nerve cells are clustered in its head, like a mammal's

(B) bodies, the scorpion's head has a cluster of nerve cells, as a mammal does

(C) body, the scorpion has a cluster of nerve cells in its head, as a mammal does

(D) body, nerve cells are clustered in the scorpion's head, like a mammal's

(E) body, a cluster of nerve cells is in the scorpion's head, like a mammal's

S T O P
IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS SECTION ONLY.
DO NOT TURN TO ANY OTHER SECTION IN THE TEST.

SECTION 3
Time—25 minutes
16 Questions

Directions: In this section solve each problem, using any available space on the page for scratchwork. Then indicate the best of the answer choices given.

Numbers: All numbers used are real numbers.

Figures: Figures that accompany problems in this section are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that its figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.

1. $\sqrt{784} =$
(A) 28
(B) 32
(C) 38
(D) 56
(E) 112

2. A total of x tourists were transported by bus to a certain museum. If there were y tourists on each bus, which of the following expresses the number of buses used?

(A) xy

(B) $\dfrac{x}{y}$

(C) $\dfrac{y}{x}$

(D) $x - y$

(E) y^x

3. If n is an integer, which of the following must be even?

(A) $n + 1$
(B) $n + 2$
(C) $2n$
(D) $2n + 1$
(E) n^2

4. $\dfrac{1}{0.75 - 1} =$

(A) -4
(B) -0.25
(C) 0.25
(D) 0.75
(E) 4

5. Sixty percent of the members of a study group are women, and 45 percent of those women are lawyers. If one member of the study group is to be selected at random, what is the probability that the member selected is a woman lawyer?

(A) 0.10
(B) 0.15
(C) 0.27
(D) 0.33
(E) 0.45

6. The dimensions of a rectangular floor are 16 feet by 20 feet. When a rectangular rug is placed on the floor, a strip of floor 3 feet wide is exposed on all sides. What are the dimensions of the rug, in feet?

(A) 10 by 14
(B) 10 by 17
(C) 13 by 14
(D) 13 by 17
(E) 14 by 16

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7. Harry started a 6-mile hike with a full 10-cup canteen of water and finished the hike in 2 hours with 1 cup of water remaining in the canteen. If the canteen leaked at the rate of 1 cup per hour and Harry drank 3 cups of water during the last mile, how many cups did he drink per mile during the first 5 miles of the hike?

(A) $\dfrac{4}{5}$

(B) $\dfrac{5}{6}$

(C) 1

(D) $\dfrac{6}{5}$

(E) $\dfrac{5}{4}$

8. The original retail price of an appliance was 60 percent more than its wholesale cost. If the appliance was actually sold for 20 percent less than the original retail price, then it was sold for what percent more than its wholesale cost?

(A) 20%
(B) 28%
(C) 36%
(D) 40%
(E) 42%

9. If y is an integer, then the least possible value of $|23 - 5y|$ is

(A) 1
(B) 2
(C) 3
(D) 4
(E) 5

10. The president of a country and 4 other dignitaries are scheduled to sit in a row on the 5 chairs represented above. If the president must sit in the center chair, how many different seating arrangements are possible for the 5 people?

(A) 4
(B) 5
(C) 20
(D) 24
(E) 120

11. If the sum of two positive integers is 24 and the difference of their squares is 48, what is the product of the two integers?

(A) 108
(B) 119
(C) 128
(D) 135
(E) 143

12. The volume of a sphere with radius r is $\frac{4}{3}\pi r^3$ and the surface area is $4\pi r^2$. If a spherical balloon has a volume of 972π cubic centimeters, what is the surface area of the balloon in square centimeters?

(A) 324
(B) 729
(C) 243π
(D) 324π
(E) 729π

13. On a certain scale of intensity, each increment of 10 in magnitude represents a tenfold increase in intensity. On this scale, an intensity corresponding to a magnitude of 165 is how many times an intensity corresponding to a magnitude of 125?

(A) 40
(B) 100
(C) 400
(D) 1,000
(E) 10,000

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14. If the perimeter of square region S and the perimeter of circular region C are equal, then the ratio of the area of S to the area of C is closest to

(A) $\frac{3}{2}$

(B) $\frac{4}{3}$

(C) $\frac{3}{4}$

(D) $\frac{2}{3}$

(E) $\frac{1}{2}$

15. On a Saturday night, each of the rooms at a certain motel was rented for either $40 or $60. If 10 of the rooms that were rented for $60 had instead been rented for $40, then the total rent the motel charged for that night would have been reduced by 25 percent. What was the total rent the motel actually charged for that night?

(A) $600
(B) $800
(C) $1,000
(D) $1,600
(E) $2,400

16. If n and k are integers whose product is 400, which of the following statements must be true?

(A) $n + k > 0$
(B) $n \neq k$
(C) Either n or k is a multiple of 10.
(D) If n is even, then k is odd.
(E) If n is odd, then k is even.

Directions: For each question in this section, select the best of the answer choices given.

1. A publisher is now providing university professors with the option of ordering custom textbooks for their courses. The professors can edit out those chapters of a book they are not interested in and add material of their own choosing.

    The widespread use of the option mentioned above is LEAST likely to contribute to fulfilling which of the following educational objectives?

    (A) Coverage of material relevant to a particular student body's specific needs

    (B) Offering advanced elective courses that pursue in-depth investigation of selected topics in a field

    (C) Ensuring that students nationwide engaged in a specific course of study are uniformly exposed to a basic set of readings

    (D) Making the textbooks used in university courses more satisfactory from the individual teacher's point of view

    (E) Keeping students' interest in a course by offering lively, well-written reading assignments

2. Mechanicorp's newest product costs so little to make that it appears doubtful the company will be able to sell it without increasing the markup the company usually allows for profit: potential clients would simply not believe that something so inexpensive would really work. Yet Mechanicorp's reputation is built on fair prices incorporating only modest profit margins.

    The statements above, if true, most strongly support which of the following?

    (A) Mechanicorp will encounter difficulties in trying to set a price for its newest product that will promote sales without threatening to compromise the company's reputation.

    (B) Mechanicorp achieves large annual profits, despite small profits per unit sold, by means of a high volume of sales.

    (C) Mechanicorp made a significant computational error in calculating the production costs for its newest product.

    (D) Mechanicorp's newest product is intended to perform tasks that can be performed by other devices costing less to manufacture.

    (E) Mechanicorp's production processes are designed with the same ingenuity as are the products that the company makes.

3. Companies in the country of Kollontay can sell semiconductors in the country of Valdivia at a price that is below the cost to Valdivian companies of producing them. To help those Valdivian companies, the Valdivian legislature plans to set a minimum selling price in Valdivia for semiconductors manufactured in Kollontay that is ten percent greater than the average production costs for companies in Valdivia.

    Which of the following, if true, most seriously threatens the success of the plan?

    (A) The annual rate of inflation in Kollontay is expected to exceed ten percent within the next year.

    (B) Valdivia is not the only country where companies in Kollontay currently sell semiconductors.

    (C) Some Valdivian companies that sell semiconductors have announced that they plan to decrease their price for semiconductors.

    (D) The government of Kollontoy will also set a minimum price for selling semiconductors in that country.

    (E) Emerging companies in countries other than Kollontay will still be able to sell semiconductors in Valdivia at a price below the cost to Valdivian companies to manufacture them.

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4. An experimental microwave clothes dryer heats neither air nor cloth. Rather, it heats water on clothes, thereby saving electricity and protecting delicate fibers by operating at a lower temperature. Microwaves are waves that usually heat metal objects, but developers of a microwave dryer are perfecting a process that will prevent thin metal objects such as hairpins from heating up and burning clothes.

Which of the following, if true, most strongly indicates that the process, when perfected, will be insufficient to make the dryer readily marketable?

(A) Metal snap fasteners on clothes that are commonly put into drying machines are about the same thickness as most hairpins.

(B) Many clothes that are currently placed into mechanical dryers are not placed there along with hairpins or other thin metal objects.

(C) The experimental microwave dryer uses more electricity than future, improved models would be expected to use.

(D) Drying clothes with the process would not cause more shrinkage than the currently used mechanical drying process causes.

(E) Many clothes that are frequently machine-dried by prospective customers incorporate thick metal parts such as decorative brass studs or buttons.

5. Airplane manufacturer: I object to your characterization of our X-387 jets as dangerous. No X-387 in commercial use has ever crashed or even had a serious malfunction.

Airline regulator: The problem with the X-387 is not that it, itself, malfunctions, but that it creates turbulence in its wake that can create hazardous conditions for aircraft in its vicinity.

The airline regulator responds to the manufacturer by doing which of the following?

(A) Characterizing the manufacturer's assertion as stemming from subjective interest rather than from objective evaluation of the facts

(B) Drawing attention to the fact that the manufacturer's interpretation of the word "dangerous" is too narrow

(C) Invoking evidence that the manufacturer has explicitly dismissed as irrelevant to the point at issue

(D) Citing statistical evidence that refutes the manufacturer's claim

(E) Casting doubt on the extent of the manufacturer's knowledge of the number of recent airline disasters

6. Damaged nerves in the spinal cord do not regenerate themselves naturally, nor even under the spur of nerve-growth stimulants. The reason, recently discovered, is the presence of nerve-growth inhibitors in the spinal cord. Antibodies that deactivate those inhibitors have now been developed. Clearly, then, nerve repair will be a standard medical procedure in the foreseeable future.

Which of the following, if true, casts the most serious doubt on the accuracy of the prediction above?

(A) Prevention of the regeneration of damaged nerves is merely a by-product of the main function in the human body of the substances inhibiting nerve growth.

(B) Certain nerve-growth stimulants have similar chemical structures to those of the antibodies against nerve-growth inhibitors.

(C) Nerves in the brain are similar to nerves in the spinal cord in their ability to regenerate themselves naturally.

(D) Researchers have been able to stimulate the growth of nerves not located in the spinal cord by using only nerve-growth stimulants.

(E) Deactivating the substances inhibiting nerve growth for an extended period would require a steady supply of antibodies.

7. The human body secretes more pain-blocking hormones late at night than during the day. Consequently, surgical patients operated on at night need less anesthesia. Since larger amounts of anesthesia pose greater risks for patients, the risks of surgery could be reduced if operations routinely took place at night.

Which of the following, if true, argues most strongly against the view that surgical risks could be reduced by scheduling operations at night?

(A) Energy costs in hospitals are greatly lower at night than they are during the day.

(B) More babies are born between midnight and seven o'clock in the morning than at any other time.

(C) Over the course of a year, people's biological rhythms shift slightly in response to changes in the amounts of daylight to which the people are exposed.

(D) Nurses and medical technicians are generally paid more per hour when they work during the night than when they work during the day.

(E) Manual dexterity and mental alertness are lower in the late night than they are during the day, even in people accustomed to working at night.

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Questions 8-9

Walter: A copy of an artwork should be worth exactly what the original is worth if the two works are visually indistinguishable. After all, if the two works are visually indistinguishable, they have all the same qualities, and if they have all the same qualities, their prices should be equal.

Marissa: How little you understand art! Even if someone could make a perfect copy that is visually indistinguishable from the original, the copy would have a different history and hence not have all the same qualities as the original.

8. Which of the following is a point at issue between Walter and Marissa?

    (A) Whether a copy of an artwork could ever be visually indistinguishable from the original

    (B) Whether the reproduction of a work of art is ever worth more than the original is worth

    (C) Whether a copy of a work of art is ever mistaken for the original

    (D) Whether a copy of a work of art could have all the same qualities as the original

    (E) Whether originality is the only valuable attribute that a work of art can possess

9. Marissa uses which of the following techniques in attempting to refute Walter's argument?

    (A) Attacking his assumption that the price of an artwork indicates its worth

    (B) Raising a point that would undermine one of the claims on which his conclusion is based

    (C) Questioning his claim that a perfect copy of a work of art would be visually indistinguishable from the original

    (D) Giving reason to believe that Walter is unable to judge the quality of a work of art because of his inadequate understanding of the history of art

    (E) Proposing alternative criteria for determining whether two works of art are visually indistinguishable

10. Magnetic resonance imaging (MRI) – a noninvasive diagnostic procedure – can be used to identify blockages in the coronary arteries. In contrast to angiograms – the invasive procedure customarily used – MRI's pose no risk to patients. Thus, to guarantee patient safety in the attempt to diagnose arterial blockages, MRI's should replace angiograms in all attempts at diagnosing coronary blockages.

    Which of the following, if true, would most support the recommendation above?

    (A) Angiograms can be used to diagnose conditions other than blockages in arteries.

    (B) MRI's were designed primarily in order to diagnose blockages in the coronary arteries.

    (C) Angiograms reveal more information about the nature of a blockage than an MRI can.

    (D) An MRI is just as likely as an angiogram to identify an arterial blockage.

    (E) Some patients for whom an angiogram presents no risk are unwilling to undergo an MRI.

11. Naturally occurring chemicals cannot be newly patented once their structures have been published. Before a naturally occurring chemical compound can be used as a drug, however, it must be put through the same rigorous testing program as any synthetic compound, culmination in a published report detailing the chemical's structure and observed effects.

    If the statements above are true, which of the following must also be true on the basis of them?

    (A) Any naturally occurring chemical can be reproduced synthetically once its structure is known.

    (B) Synthetically produced chemical compounds cannot be patented unless their chemical structures are made public.

    (C) If proven no less effective, naturally occurring chemicals are to be preferred to synthetic compounds for use in drugs.

    (D) Once a naturally occurring compound has been approved for use as a drug, it can no longer be newly patented.

    (E) A naturally occurring chemical cannot be patented unless its effectiveness as a drug has been rigorously established.

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12. A public-service advertisement advises that people who have consumed alcohol should not drive until they can do so safely. In a hospital study, however, subjects questioned immediately after they consumed alcohol underestimated the time necessary to regain their driving ability. This result indicates that many people who drink before driving will have difficulty following the advertisement's advice.

Which of the following, if true, most strongly supports the argument above?

(A) Many people, if they plan to drink alcohol, make arrangements beforehand for a nondrinker to drive them home.

(B) The subjects in the hospital study generally rated their abilities more conservatively than would people drinking alcohol outside a hospital setting.

(C) Some people refrain from drinking if they will have to drive to get home afterward.

(D) The subjects in the hospital study were also questioned about the time necessary to regain abilities that do not play an important role in driving safely.

(E) Awareness of the public-service advertisement is higher among the general population than it was among the subjects in the hospital study.

13. Investigator: XYZ Coins has misled its clients by promoting some coins as "extremely rare" when in fact those coins are relatively common and readily available.

XYZ Agent: That is ridiculous. XYZ Coins is one of the largest coin dealers in the world. We authenticate the coins we sell through a nationally recognized firm and operate a licensed coin dealership.

The XYZ agent's reply is most vulnerable to the criticism that it

(A) exaggerates the investigator's claims in order to make them appear absurd

(B) accuses the investigator of bias but presents no evidence to support that accusation

(C) fails to establish that other coin dealers do not also authenticate the coins those dealers sell

(D) lists strengths of XYZ Coins while failing to address the investigator's charge

(E) provides no definition for the inherently vague phrase "extremely rare"

14. Both Writewell and Express provide round-the-clock telephone assistance to any customer who uses their word-processing software. Since customers only call the hot lines when they find the software difficult to use, and the Writewell hot line receives four times as many calls as the Express hot line, Writewell's word-processing software must be more difficult to use than Express's.

Which of the following, if true, most strengthens the argument above?

(A) Calls to the Express hot line are almost twice as long, on average, as are calls to the Writewell hot line.

(B) Express has three times the number word-processing software customers that Writewell has.

(C) Express receives twice as many letters of complaint about its word-processing software as Writewell receives about its word-processing software.

(D) The number of calls received by each of the two hot lines has been gradually increasing.

(E) The Writewell hot-line number is more widely publicized that the Express hot-line number.

15. Over the last century, paleontologists have used small differences between fossil specimens to classify triceratops into sixteen species. This classification is unjustified, however, since the specimens used to distinguish eleven of the species come from animals that lived in the same area at the same time.

Which of the following, if true, would enable the conclusion of the argument to be properly drawn?

(A) Not every species that lived in a given area is preserved as a fossil.

(B) At least one individual of every true species of triceratops bas been discovered as a fossil specimen.

(C) No geographical area ever supports more than three similar species at the same time.

(D) In many species, individuals display quite marked variation.

(E) Differences between fossil specimens of triceratops that came from the same area are no less distinctive than differences between specimens that came from different areas.

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16. Many consumers are concerned about the
     ecological effects of wasteful packaging. This
     concern probably explains why stores have been
     quick to stock new cleaning products that have been
     produced in a concentrated form. The concentrated
     form is packaged in smaller containers that use less
     plastic and require less transportation space.

     Which of the following, if true, most seriously
     undermines the explanation offered above?

     (A) Few consumers believe that containers of
          concentrated cleaning products are merely
          small packages of regular cleaning products.

     (B) The containers in which concentrated cleaning
          products are packaged are no harder to recycle
          than those in which regular cleaning products
          are packaged.

     (C) Those concentrated cleaning products that are
          intended to be used diluted have clear
          instructions for dilution printed on their labels.

     (D) The smaller containers of concentrated cleaning
          products enable supermarkets and drugstores to
          increase their revenues from a given shelf
          space.

     (E) Consumer pressure has led to the elimination of
          wasteful cardboard packaging that was used for
   compact discs.

Directions: In this section solve each problem, using any available space on the page for scratchwork. Then indicate the best of the answer choices given.

Numbers: All numbers used are real numbers.

Figures: Figures that accompany problems in this section are intended to provide information useful in solving the problems. They are drawn as accurately as possible EXCEPT when it is stated in a specific problem that its figure is not drawn to scale. All figures lie in a plane unless otherwise indicated.

1. If x is negative, which of the following must be positive?

I. x^2
II. $(-1) x$
III. $\dfrac{1}{x}$

(A) I only
(B) I and II only
(C) I and III only
(D) II and III only
(E) I, II and III

2. The employees of Smith Enterprises received wage increases ranging from 30 cents to $87\frac{1}{2}$ cents per hour. What was the minimum wage increase for a 40-hour week?

(A) $12.00
(B) $23.00
(C) $34.80
(D) $35.00
(E) $35.20

4. The sum of 3 hours 45 minutes and 2 hours 55 minutes is approximately what percent of a day?

(A) 14%
(B) 16%
(C) 24%
(D) 28%
(E) 72%

5. A salesman makes a 20 percent commission on the selling price of each set of encyclopedias he sells. If he sells 12 identical sets of encyclopedias and makes $1,800 in commissions, what is the selling price of each set?

(A) $300
(B) $600
(C) $750
(D) $900
(E) $1,080

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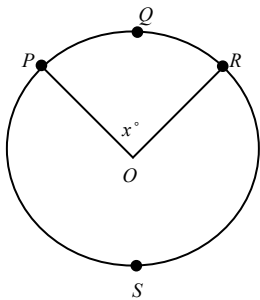
3. If O is the center of the circle above and the length of arc RSP is twice the length of arc PQR, then x equals
(A) 60
(B) 100
(C) 120
(D) 150
(E) 240

6. If $x < 12$, then it must be true that

    (A) $-x < -12$
    (B) $-x - 2 < 14$
    (C) $-x + 2 < -10$
    (D) $x + 2 < 10$
    (E) $x - 2 < 11$

7. The 10 households on a certain street have household incomes that range from $34,000 to $150,000 and an average (arithmetic mean) household income of $60,000. If the household with the highest income and the one with the lowest income are excluded, what is the average household income for the remaining 8 households?

    (A) $41,000
    (B) $47,000
    (C) $52,000
    (D) $61,000
    (E) $75,000

8. If $x = y + 4$ and $x = 20 - y$, then $x^2 - y^2 =$

    (A) 16
    (B) 80
    (C) 144
    (D) 256
    (E) 384

9. On level farmland, two runners leave at the same time from the intersection of two country roads. One runner jogs due north at a constant rate of 8 miles per hour while the second runner jogs due east at a constant rate that is 4 miles per hour faster than the first runner's rate. How far apart, to the nearest mile, will they be after $\frac{1}{2}$ hour?

    (A) 6
    (B) 7
    (C) 8
    (D) 12
    (E) 14

10. A square playground has the same area as a rectangular playground that is 30 meters longer but 20 meters narrower. What is the length, in meters, of a side of the square playground?

    (A) $10\sqrt{5}$
    (B) $10\sqrt{6}$
    (C) 25
    (D) 50
    (E) 60

11. The price of a dress was first discounted by a certain percent and later by 25 percent of the discounted price. If these two discounts are equivalent to a single discount of 40 percent of the original price, what was the first discount?

    (A) 10%
    (B) 15%
    (C) 20%
    (D) 30%
    (E) 65%

12. If it is assumed that each of the n production workers in a factory assembles one instrument every t minutes, how many instruments does the factory assemble in 7.5 hours of production?

    (A) $\dfrac{450\,n}{t}$

    (B) $\dfrac{450\,t}{n}$

    (C) $450nt$

    (D) $\dfrac{7.5\,tn}{60}$

    (E) $\dfrac{7.5n}{60t}$

13. What is the difference between the sixth and the fifth terms of the sequence 2, 4, 7, … whose nth term is $n + 2^{n-1}$?

    (A) 2
    (B) 3
    (C) 6
    (D) 16
    (E) 17

14. Which of the following could be the sum of the reciprocals of two different prime numbers?

    (A) $\frac{7}{13}$
    (B) $\frac{10}{21}$
    (C) $\frac{11}{30}$
    (D) $\frac{23}{50}$
    (E) $\frac{19}{77}$

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15. The rear wheels of a car crossed a certain line 0.5 second after the front wheels crossed the same line. If the centers of the front and rear wheels are 20 feet apart and the car traveled in a straight line at a constant speed, which of the following gives the speed of the car in miles per hour? (5,280 feet = 1 mile).

(A) $\left(\dfrac{20}{5,280}\right)\left(\dfrac{60^2}{0.5}\right)$

(B) $\left(\dfrac{20}{5,280}\right)\left(\dfrac{60}{0.5}\right)$

(C) $\left(\dfrac{20}{5,280}\right)\left(\dfrac{0.5}{60^2}\right)$

(D) $\dfrac{(20)(5,280)}{\left(60^2\right)(0.5)}$

(E) $\dfrac{(20)(5,280)}{(60)(0.5)}$

16. Working alone, a small pump takes twice as long as a large pump takes to fill an empty tank. Working together at their respective constant rates, the pumps can fill the tank in 6 hours. How many hours would it take the small pump to fill the tank working alone?

(A) 8
(B) 9
(C) 12
(D) 15
(E) 18

S T O P
IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS SECTION ONLY.
DO NOT TURN TO ANY OTHER SECTION IN THE TEST.

Directions: Each passage in this group is followed by questions based on its content. After reading a passage, choose the best answer to each question and fill in the corresponding oval on the answer sheet. Answer all questions following a passage on the basis of what is stated or implied in the passage.

In an attempt to improve the overall performance of clerical workers, many companies have introduced computerized performance monitoring and control systems (CPMCS) that record and report a worker's computer-
Line
(5) driven activities. However, at least one study has shown that such monitoring may not be having the desired effect. In the study, researchers asked monitored clerical workers and their supervisors how assessments of productivity affected supervisors' ratings of workers' performance. In
(10) contrast to unmonitored workers doing the same work, who without exception identified the most important element in their jobs as customer service, the monitored workers and their supervisors all responded that productivity was the critical factor in assigning ratings. This finding suggested
(15) that there should have been a strong correlation between a monitored worker's productivity and the overall rating the worker received. However, measures of the relationship between overall rating and individual elements of performance clearly supported the conclusion that supervisors
(20) gave considerable weight to criteria such as attendance, accuracy, and indications of customer satisfaction.
It is possible that productivity may be a "hygiene factor," that is, if it is too low, it will hurt the overall rating. But the evidence suggests that beyond the point at
(25) which productivity becomes "good enough," higher productivity per se is unlikely to improve a rating.

1.   According to the passage, before the final results of the study were known, which of the following seemed likely?

(A) That workers with the highest productivity would also be the most accurate

(B) That workers who initially achieved high productivity ratings would continue to do so consistently

(C) That the highest performance ratings would be achieved by workers with the highest productivity

(D) That the most productive workers would be those whose supervisors claimed to value productivity

(E) That supervisors who claimed to value productivity would place equal value on customer satisfaction

2.   It can be inferred that the author of the passage discusses "unmonitored workers" (line 10) primarily in order to

(A) compare the ratings of these workers with the ratings of monitored workers

(B) provide an example of a case in which monitoring might be effective

(C) provide evidence of an inappropriate use of CPMCS

(D) emphasize the effect that CPMCS may have on workers' perceptions of their jobs

(E) Illustrate the effect that CPMCS may have on workers' ratings

3.   Which of the following, if true, would most clearly have supported the conclusion referred to in lines 19-21?

(A) Ratings of productivity correlated highly with ratings of both accuracy and attendance.

(B) Electronic monitoring greatly increased productivity.

(C) Most supervisors based overall ratings of performance on measures of productivity alone.

(D) Overall ratings of performance correlated more highly with measures of productivity that the researchers expected.

(E) Overall ratings of performance correlated more highly with measures of accuracy than with measures of productivity.

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4. According to the passage, a "hygiene factor" (lines 22-23) is an aspect of a worker's performance that
    (A) has no effect on the rating of a worker's performance
    (B) is so basic to performance that it is assumed to be adequate for all workers
    (C) is given less importance than it deserves in rating a worker's performance
    (D) is not likely to affect a worker's rating unless it is judged to be inadequate
    (E) is important primarily because of the effect it has on a worker's rating

5. The primary purpose of the passage is to
    (A) explain the need for the introduction of an innovative strategy
    (B) discuss a study of the use of a particular method
    (C) recommend a course of action
    (D) resolve a difference of opinion
    (E) suggest an alternative approach

Schools expect textbooks to be a valuable source of information for students. My research suggests, however, that textbooks that address the place of Native Americans within the history of the United States distort history to suit a particular cultural value system. In some textbooks, for example, settlers are pictured as more humane, complex, skillful, and wise than Native Americans. In essence, textbooks stereotype and deprecate the numerous Native American cultures while reinforcing the attitude that the European conquest of the New World denotes the superiority of European cultures. Although textbooks evaluate Native American architecture, political systems, and home-making, I contend that they do it from an ethnocentric, European perspective without recognizing that other perspectives are possible.

One argument against my contention asserts that, by nature, textbooks are culturally biased and that I am simply underestimating children's ability to see through these biases. Some researchers even claim that by the time students are in high school, they know they cannot take textbooks literally. Yet substantial evidence exists to the contrary. Two researchers, for example, have conducted studies that suggest that children's attitudes about particular cultures are strongly influenced by the textbooks used in schools. Given this, an ongoing, careful review of how school textbooks depict Native Americans is certainly warranted.

6. Which of the following would most logically be the topic of the paragraph immediately following the passage?

(A) Specific ways to evaluate the biases of United States history textbooks

(B) The centrality of the teacher's role in United States history courses

(C) Nontraditional methods of teaching United States history

(D) The contributions of European immigrants to the development of the United States

(E) Ways in which parents influence children's political attitudes

7. The primary purpose of the passage is to

(A) describe in detail one research study regarding the impact of history textbooks on children's attitudes and beliefs about certain cultures

(B) describe revisions that should be made to United States history textbooks

(C) discuss the difficulty of presenting an accurate history of the United States

(D) argue that textbooks used in schools stereotype Native Americans and influence children's attitudes

(E) summarize ways in which some textbooks give distorted pictures of the political systems developed by various Native American groups

8. The author mentions two researchers' studies (lines 22-25) most likely in order to

(A) suggest that children's political attitudes are formed primarily through textbooks

(B) counter the claim that children are able to see through stereotypes in textbooks

(C) suggest that younger children tend to interpret the messages in textbooks more literally than do older children

(D) demonstrate that textbooks carry political messages meant to influence their readers

(E) prove that textbooks are not biased in terms of their political presentations

9. The author's attitude toward the content of the history textbooks discussed in the passage is best described as one of

(A) indifference

(B) hesitance

(C) neutrality

(D) amusement

(E) disapproval

10. It can be inferred from the passage that the researchers mentioned in line 19 would be most likely to agree with which of the following statements?

(A) Students from attitudes about cultures other than their own primarily inside the school environment.

(B) For the most part, seniors in high school know that textbooks can be biased.

(C) Textbooks play a crucial role in shaping the attitudes and beliefs of students.

(D) Elementary school students are as likely to recognize biases in textbooks as are high school students.

(E) Students are less likely to give credence to history textbooks than to mathematics textbooks.

11. The author implies that which of the following will occur if textbooks are not carefully reviewed?

(A) Children will remain ignorant of the European settlers' conquest of the New World.

(B) Children will lose their ability to recognize biases in textbooks.

(C) Children will from negative stereotypes of Native Americans.

(D) Children will develop an understanding of ethnocentrism.

(E) Children will stop taking textbooks seriously.

GO ON TO THE NEXT PAGE.

Until recently, scientists did not know of a close verte-
brate analogue to the extreme form of altruism observed in
eusocial insects like ants and bees, whereby individuals
cooperate, sometimes even sacrificing their own oppor-
tunities to survive and reproduce, for the good of others.
However, such a vertebrate society may exist among under-
ground colonies of the highly social rodent *Heterocephalus
glaber*, the naked mole rat.

A naked mole rat colony, like a beehive, wasp's nest, or
termite mound, is ruled by its queen, or reproducing
female. Other adult female *mole* rats neither ovulate nor
breed. The queen is the largest member of the colony, and
she maintains her breeding status through a mixture of
behavioral and, presumably, chemical control. Queens have
been long-lived in captivity, and when they die or are
removed from a colony one sees violent fighting for breed-
ing status among the larger remaining females, leading to a
takeover by a new queen.

Eusocial insect societies have rigid caste systems, each
insect's role being defined by its behavior, body shape, and
physiology. In naked mole rat societies, on the other hand,
differences in behavior are related primarily to reproductive
status (reproduction being limited to the queen and a few
males), body size, and perhaps age. Smaller nonbreeding
members, both male and female, seem to participate pri-
marily in gathering food, transporting nest material, and
tunneling. Larger nonbreeders are active in defending the
colony and perhaps in removing dirt from the tunnels.
Jarvis' work has suggested that differences in growth rates
may influence the length of time that an individual performs
a task, regardless of age.

Cooperative breeding has evolved many times in verte-
brates, but unlike naked mole rats, most cooperatively
breeding vertebrates (except the wild dog, *Lycaon pictus*)
are dominated by a pair of breeders rather than by a single
breeding female. The division of labor within social groups
is less pronounced among other vertebrates than among
naked mole rats, colony size is much smaller, and mating
by subordinate females may not be totally suppressed,
whereas in naked mole rat colonies subordinate females are
not sexually active, and many never breed.

12. Which of the following most accurately states the
main idea of the passage?

(A) Naked mole rat colonies are the only known
examples of cooperatively breeding vertebrate
societies.

(B) Naked mole rat colonies exhibit social
organization based on a rigid caste system.

(C) Behavior in naked mole rat colonies may well
be a close vertebrate analogue to behavior in
eusocial insect societies.

(D) The mating habits of naked mole rats differ
from those of any other vertebrate species.

(E) The basis for the division of labor among
naked mole rats is the same as that among
eusocial insects.

13. The passage suggests that Jarvis' work has called
into question which of the following explanatory
variables for naked mole rat behavior?

(A) Size

(B) Age

(C) Reproductive status

(D) Rate of growth

(E) Previously exhibited behavior

14. It can be inferred from the passage that the
performance of tasks in naked mole rat colonies
differs from task performance in eusocial insect
societies in which of the following ways?

(A) In naked mole rat colonies, all tasks are
performed cooperatively.

(B) In naked mole rat colonies, the performance of
tasks is less rigidly determined by body shape.

(C) In naked mole rat colonies, breeding is limited
to the largest animals.

(D) In eusocial insect societies, reproduction is
limited to a single female.

(E) In eusocial insect societies, the distribution of
tasks is based on body size.

15. According to the passage, which of the following is a
supposition rather than a fact concerning the queen
in a naked mole rat colony?

(A) She is the largest member of the colony.

(B) She exerts chemical control over the colony.

(C) She mates with more than one male.

(D) She attains her status through aggression.

(E) She is the only breeding female.

16. The passage supports which of the following
inferences about breeding among *Lycaon pictus*?

(A) The largest female in the social group does not
maintain reproductive status by means of
behavioral control.

(B) An individual's ability to breed is related
primarily to its rate of growth.

(C) Breeding is the only task performed by the
breeding female.

(D) Breeding in the social group is not cooperative.

(E) Breeding is not dominated by a single pair of
dogs.

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17. According to the passage, naked mole rat colonies may differ from all other known vertebrate groups in which of the following ways?

(A) Naked mole rats exhibit an extreme form of altruism.

(B) Naked mole rats are cooperative breeders.

(C) Among naked mole rats, many males are permitted to breed with a single dominant female.

(D) Among naked mole rats, different tasks are performed at different times in an individual's life.

(E) Among naked mole rats, fighting results in the selection of a breeding female.

18. One function of the third paragraph of the passage is to

(A) state a conclusion about facts presented in an earlier paragraph

(B) introduce information that is contradicted by information in the fourth paragraph

(C) qualify the extent to which two previously mentioned groups might be similar

(D) show the chain of reasoning that led to the conclusions of a specific study

(E) demonstrate that, of three explanatory factors offered, two may be of equal significance

S T O P
IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS SECTION ONLY.
DO NOT TURN TO ANY OTHER SECTION IN THE TEST.

Time — 25 minutes

20 Questions

Directions: Each of the data sufficiency problems below consists of a question and two statements, labeled (1) and (2), in which certain data are given. You have to decide whether the data given in the statements are <u>sufficient</u> for answering the question. Using the data given in the statements <u>plus</u> your knowledge of mathematics and everyday facts (such as the number of days in July or the meaning of *counterclockwise*), you are to fill in oval

- A if statement (1) ALONE is sufficient, but statement (2) alone is not sufficient to answer the question asked;

- B if statement (2) ALONE is sufficient, but statement (1) alone is not sufficient to answer the question asked;

- C if BOTH statements (1) and (2) TOGETHER are sufficient to answer the question asked, but NEITHER statement ALONE is sufficient;

- D if EACH statement ALONE is sufficient to answer the question asked;

- E if statements (1) and (2) TOGETHER are NOT sufficient to answer the question asked, and additional data specific to the problem are needed.

Numbers: All numbers used are real numbers.

Figures: A figure in a data sufficiency problem will conform to the information given in

the question, but will not necessarily conform to the additional information given

in statements (1) and (2).

You may assume that lines shown as straight are straight and that angle measures are greater than zero.

You may assume that the positions of points, angles, regions, etc., exist in the order shown.

All figures lie in a plane unless otherwise indicated.

Note: In questions that ask for the value of a quantity, the data given in the statements are

sufficient only when it is possible to determine exactly one numerical value for

the quantity.

Example:

In $\triangle PQR$, what is the value of x?
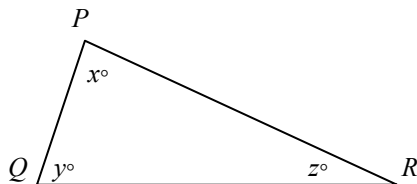
(1) $PQ = PR$

(2) $y = 40$

Explanation: According to statement (1), $PQ = PR$; therefore, PQR is isosceles and $y = z$. Since $x + y + z = 180$, it follows that $x + 2y = 180$. Since statement (1) does not give a value for y, you cannot answer the question using statement (1) alone. According to statement (2), $y = 40$; therefore, $x + z = 140$. Since statement (2) does not give a value for z, you cannot answer the question using statement (2) alone. Using both statements together, since $x + 2y = 180$ and the value of y is given, you can find the value of x. Therefore, the answer is C.

GO ON TO THE NEXT PAGE.

A Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.
B Statement (2) ALONE is sufficient, but statement (1) alone is not sufficient.
C BOTH statements TOGETHER are sufficient, but NEITHER statement ALONE is sufficient.
D EACH statement ALONE is sufficient.
E Statements (1) and (2) TOGETHER are NOT sufficient.

1. What is 5 percent of x ?

   (1) $x = 200$

   (2) 10 percent of x is 20.

2. For which type of investment, J or K, is the annual rate of return greater?

   (1) Type J returns $115 per $1,000 invested for any one-year period and type K returns $300 per $2,500 invested for any one-year period.

   (2) The annual rate of return for an investment of type K is 12 percent.

3. What is the value of $\left(\dfrac{a}{b}\right)^n$?

   (1) $a^n = 32$

   (2) $b^n = 243$

4. What is the tenths digit of the decimal d ?

   (1) $d = \dfrac{7}{25}$

   (2) d is 28 percent of 1.

5. Is $a = 0$?

   (1) $ab = 0$

   (2) $a^2 = 0$

6. What percent of the drama club members enrolled at a certain school are female students?

   (1) Of the female students enrolled at the school, 40 percent are members of the drama club.

   (2) Of the male students enrolled at the school, 25 percent are members of the drama club.

7. What is the perimeter of rectangle R ?

   (1) R is a square.

   (2) The area of R is 36.

8. Carmen currently works 30 hours per week at her part-time job. If her gross hourly wage were to increase by $1.50, how many fewer hours could she work per week and still earn the same gross weekly pay as before the increase?

   (1) Her gross weekly pay is currently $225.00.

   (2) An increase of $1.50 would represent an increase of 20 percent of her current gross hourly wage.

9. In a serving of a breakfast cereal that contains only oats, raisins, and nuts, the ratio of oats to raisins to nuts by weight is 3 to 2 to 1, respectively. How many ounces of raisins are in the serving?

   (1) The serving weighs 4 ounces.

   (2) The serving contains 2 ounces of oats.

10. Is $x > 0$?

    (1) $x^2 > 0$

    (2) $x^3 > 0$

11. A taxi company charges f cents for the first mile of the taxi ride and m cents for each additional mile. How much does the company charge for a 10-mile taxi ride?

    (1) The company charges $0.90 for a 2-mile ride.

    (2) The company charges $1.20 for a 4-mile ride.

12. What was the discounted price of a certain television set?

    (1) The original price of the television set was $50 more than the discounted price.

    (2) The original price of the television set was 110 percent of the discounted price.

GO ON TO THE NEXT PAGE.

A Statement (1) ALONE is sufficient, but statement (2) alone is not sufficient.

13.   If $x > 0$, is $\dfrac{x}{y} > x$?

    (1) $0 < y < 1$

    (2) $x > 1$

14.   Is n an integer?

    (1) $2n$ is an integer.

    (2) $\dfrac{n}{2}$ is an integer.

15.   At what speed was a train traveling on a trip when it had completed half of the total distance of the trip?

    (1) The trip was 460 miles long and took 4 hours to complete.

    (2) The train traveled at an average rate of 115 miles per hour on the trip.

16.   If r and s are integers, is $r^2 + s$ even?

    (1) The product of rs is odd.

    (2) r is odd.

17.   What is the volume of a certain rectangular solid?

    (1) Two adjacent faces of the solid have areas 15 and 24, respectively.

    (2) Each of two opposite faces of the solid has area 40.

18.   Is $x > y$?

    (1) $ax > ay$

    (2) $a^2 x > a^2 y$

19.   If n is a positive integer and $k = 5.1 \times 10^n$, what is the value of k ?

    (1) $6,000 < k < 500,000$

    (2) $k^2 = 2.601 \times 10^9$

20.   What is the average (arithmetic mean) of $3x$ and $6y$?

    (1) $x + 2y = 7$

    (2) $x + y = 5$

STOP
IF YOU FINISH BEFORE TIME IS CALLED, YOU MAY CHECK YOUR WORK ON THIS SECTION ONLY.
DO NOT TURN TO ANY OTHER SECTION IN THE TEST

ANSWER KEY – Test Code 48

Section 1	Section 3	Section 4	Section 5	Section 6	Section 7
1. E	1. A	1. C	1. B	1. C	1. D
2. D	2. B	2. A	2. D	2. D	2. A
3. D	3. C	3. E	3. C	3. E	3. C
4. A	4. A	4. E	4. D	4. D	4. D
5. E	5. C	5. B	5. C	5. B	5. B
6. A	6. A	6. A	6. E	6. A	6. E
7. E	7. A	7. E	7. C	7. D	7. C
8 .C	8. B	8. D	8. B	8. B	8. D
9. B	9. B	9. B	9. B	9. E	9. D
10. A	10. D	10. D	10. E	10. B	10. B
11. E	11. E	11. D	11. C	11. C	11.C
12. D	12. D	12. B	12. A	12. C	12. C
13. C	13. E	13. D	13. E	13. B	13. A
14. B	14. C	14. B	14. B	14. B	14. B
15. B	15.B	15. C	15. A	15. B	15. E
16. D	16. E	16. D	16. E	16. E	16. A
17. C				17. A	17. C
18. C				18. C	18. B
19. B					19. D
20. B					20. A
21. A					
22. C					

CONVERSION TABLE FOR VERBAL AND QUANTITATIVE SCORES

Graduate Management Admission Test, Code 48

Corrected Raw Score	Verbal Score	Quantitative Score	Corrected Raw Score	Verbal Score	Quantitative Score	Corrected Raw Score	Verbal Score	Quantitative Score
56	50		31	30	35	6	12	14
55	49		30	30	35	5	12	13
54	48		29	29	34	4	11	12
53	47		28	28	33	3	10	12
52	46	51	27	27	32	2	9	11
51	45	50	26	27	32	1	9	10
50	44	50	25	26	31	0	8	9
49	43	49	24	25	30			
48	43	48	23	25	29			
47	42	48	22	24	29			
46	41	47	21	23	28			
45	40	46	20	22	27			
44	40	45	19	22	26			
43	39	44	18	21	26			
42	38	44	17	20	25			
41	38	43	16	19	24			
40	37	42	15	19	23			
39	36	41	14	18	22			
38	35	41	13	17	21			
37	35	40	12	17	20			
36	34	39	11	16	20			
35	33	38	10	15	19			
34	32	38	9	14	18			
33	32	37	8	14	17			
32	31	36	7	13	16			

CONVERSION TABLE FOR TOTAL SCORES

Graduate Management Admission Test, Code 48

Corrected Raw Score	Total Scaled Score	Corrected Raw Score	Total Scaled Score	Corrected Raw Score	Total Scaled Score	Corrected Raw Score	Total Scaled Score
108	800	78	630	48	480	18	320
107	790	77	630	47	470	17	310
106	780	76	620	46	470	16	310
105	780	75	620	45	460	15	300
104	770	74	610	44	460	14	290
103	770	73	610	43	450	13	290
102	760	72	600	42	450	12	280
101	760	71	600	41	440	11	270
100	750	70	590	40	430	10	250
99	740	69	590	39	430	9	240
98	740	68	580	38	420	8	230
97	730	67	580	37	420	7	220
96	730	66	570	36	410	6	210
95	720	65	570	35	410	5	200
94	720	64	560	34	400	4	200
93	710	63	560	33	400	3	200
92	710	62	550	32	390	2	200
91	700	61	550	31	390	1	200
90	700	60	540	30	380	0	200
89	690	59	530	29	380		
88	690	58	530	28	370		
87	680	57	520	27	370		
86	680	56	520	26	360		
85	670	55	510	25	360		
84	670	54	510	24	350		
83	660	53	500	23	350		
82	660	53	500	23	350		
81	650	51	490	21	340		
80	640	50	490	20	330		
79	640	49	480	19	320		

SCORING INFORMATION

Calculating and Verifying Your Multiple-Choice Scores

Proceed with the following steps.

1. As you match the responses on your answer sheet with the answer key on page 29, use marks to indicate whether each answer is correct or incorrect. Cross out any questions you omitted, or for which you marked more than one answer, because they are not counted in the scoring. The number of questions crossed out should equal the "raw score total omit" figure on your score report. The number of questions crossed out in the three sections that contributed to your verbal score and the similar number for the three sections that contributed to the quantitative score should match the "raw score verbal omit" and "raw score quantitative omit" figures on your score report.
2. Count the total number of questions you answered correctly in the three sections that contributed to the verbal score. This number should match the "raw score verbal right" figure on your score report.
3. Then count the total number of questions you answered incorrectly in these three sections. This number should match the "raw score verbal wrong" figure on your score report.
4. Divide the number answered incorrectly from Step 3 by four.
5. Subtract the result in Step 4 from the number answered correctly in Step 2. This is the correction for guessing.
6. Round the resulting number to the nearest whole number by adding .5 and then dropping all digits to the right of the decimal point. This number should equal the "verbal corrected raw score" figure on your score report.

■■

The table below shows three examples of corrected raw score calculations based on 40 questions (total number of omitted or multiple-marked questions, number correct, and number wrong):

	Example 1	Example 2	Example 3
Step 1- Number omitted or multiple-marked……..	8	0	5
Step 2- Number correct…	20	25	30
Step 3- Number wrong….	12	15	5
Step 4- Number wrong in step 3 divided by 4……..	3	3.75	1.25
Step 5- Number in step 2 minus number in step 4	17	21.25	28.75
Step 6- Rounding- Add .5 to the number in step 5	17.5	21.75	29.25
Final raw score corrected for guessing: Drop all digits to the right of the decimal in step 6………...	17	21	29

Repeat these steps using the three sections contributing to the quantitative score to calculate your quantitative corrected raw score and all six sections contributing to the total score to obtain your total corrected raw score. The figures you calculate should match the respective figures on your score report. The sum of your verbal and quantitative corrected raw scores may be one point higher or lower than the total corrected raw score due to the rounding procedure for each score.

Conversion of Corrected Raw Scores to Scaled Scores

Use the score conversion tables on pages 30 and 31 to find the scaled score associated with each of your corrected raw scores. The equivalent scaled scores should match those on your score report.

Your Analytical Writing Scores

Analytical Writing Assessments are offered in this test preparation product for practice purposes only. When calculating the GMAT® equivalent score on GMAT Paper Tests, the essay portion should be ignored. When taking the GMAT®, the Analytical Writing Assessment results are reported on your official score report to schools.

Essay Insight (SM), available through www.mba.com, lets you write two practice essays on actual AWA topics and has them scored automatically by the same technology used to score the GMAT. Your scores are objective and accurate, so you can practice to improve.

Rescoring Service

If there are any discrepancies between your self-scoring results and those on your score report, you may request that ETS rescore your answer sheet by submitting the appropriate fee and the form for this purpose you're your *GMAT Examinee Score Interpretation Guide*. But first check your answer sheet from incomplete erasures or light or partial marking, and check your calculations to be sure that they are accurate.

Caveats Regarding Raw Score Interpretation

1. The GMAT is designed to yield only the reported verbal, quantitative, and total scaled scores. One should not calculate raw scores or individual test sections and infer specific strengths or weaknesses from a comparison of the raw scores results by section. There are two reasons for this. First, different sections have different numbers of questions, and, even if the number were the same of if percentages were used to make the numbers comparable, the sections might not be equally difficult. For illustrative purposes only, suppose that one section had 20 items and another had 25. Furthermore, suppose you received corrected raw scores of 10 on the first and 10 on the second. It would be inappropriate to conclude that you had equal ability in the two sections because the corrected raw scores were equal, as you really obtained 50 percent for the first section and only 40 percent for the second. It would be equally inappropriate, however, to conclude from the percentages that you did better on the first section than on the second. Suppose the first section was relatively easy for most examinees (say, an average corrected raw score percentage across examines of 55 percent) and the second was relatively difficult (an average raw score percentage of 35 percent). Now you might conclude that you did less well than average on the first section and better than average on the second.

    Differences in difficulty level between editions are accounted for in the procedure for converting the verbal, quantitative, and total corrected raw scores to scaled scores. Since the corrected raw scores for individual sections are not converted to produce scales scores by section, performance on individual sections of the test cannot be compared.

    Second, corrected raw scores by section ate not converted to scaled scores by section because the GMAT is not designed to reliably measure specific strengths and weaknesses beyond the general verbal and quantitative abilities for which separate scaled scores are reported. Reliability is dependent, in part, on the number of questions in the test- the more questions, the higher the reliability. The relatively few questions in each section, taken alone, are not sufficient to produce a reliable result for each section (see "Accuracy of the Scores" in the *GMAT Examinee Score Interpretation Guide*.) Only the reported verbal, quantitative, and total scaled scores (which are based on questions from several sections) have sufficient reliability to permit their use in counseling and predicting graduate school performance.

2. It is possible, if you repeat the test, that your second raw scores corrected for guessing could be higher than on the first test, but your scaled scores could be lower and vice versa. This is a result of the slight differences in difficulty level between editions of the test, which are taken into account when corrected raw scores are converted to the GMAT scaled scores. That is, for a given scaled score, a more difficult edition requires a lower corrected raw score and an easier edition requires a high corrected raw score.

Additional Information

If you have questions about any of the information in this booklet, please write to:

> Graduate Management Admission Test
>
> Educational Testing Service
>
> P.O. Box 6102
>
> Princeton, NJ 08541-6102

If you have questions about specific test questions, please indicate that test code and the number(s) of the question(s) as well as your query or comment.