New Mexico NM-MSSA Grade 7 Math Practice

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MSSA

NM-MSSA

Mathematics

Grade 7 · Practice Test

Mathematics Session 1

Today you will take a test in mathematics. For this test, you will answer selected-response and constructed-response questions. Some of the questions may look different from test questions you have seen before, and some may ask about material that is new to you, but it is important to do your best. If you are not sure of the answer to a question, you should still try to answer it.

You may NOT use a calculator to answer the questions in this session.

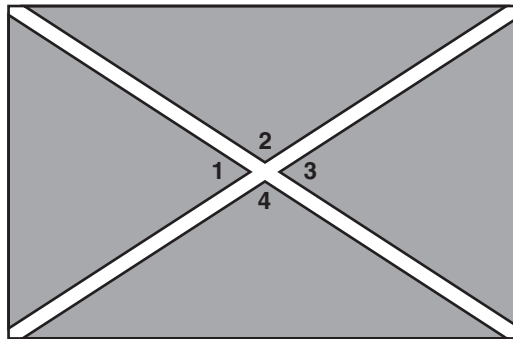1. Angie paid a total of $750 for 10 tickets to a musical. The money was taken from her bank account.

   Which expression represents the dollar amount that was taken from Angie's bank account?

   A $\dfrac{750}{10}$

   B $-75(10)$

   C $-\left(\dfrac{75}{10}\right)$

   D $750(10)$

2.   This diagram shows a rectangular park with diagonals that represent sidewalks.

The measure of ∠1 = 66°. What is the measure of ∠2?

A   24°

B   104°

C   114°

D   294°

3.   A piece of cheese is shaped like a right triangular prism.
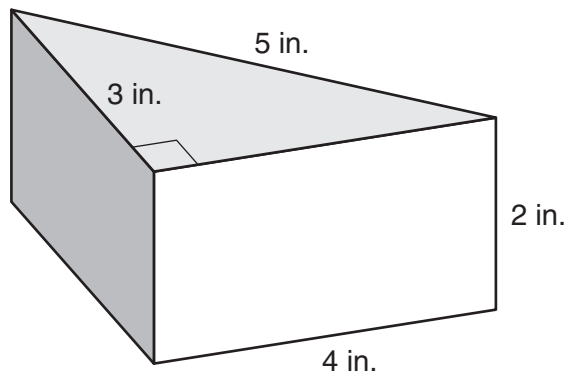
The **entire** surface of the cheese will be covered with a wax coating. What is the surface area of the piece of cheese?

A   20 square inches

B   26 square inches

C   32 square inches

D   36 square inches

4. A store is having a sale. Each item is on sale for half off the regular price, *m*.

Which pair of equivalent expressions represents the sale price for any one item?

A 0.5*m* and $m - \dfrac{1}{2}$

B 0.5*m* and $m - \dfrac{1}{2}m$

C $m - 0.5$ and $m - \dfrac{1}{2}$
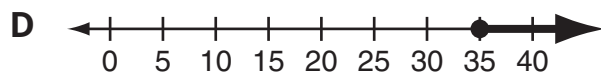
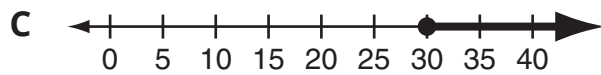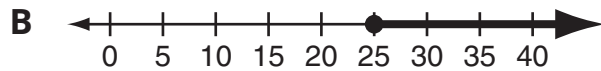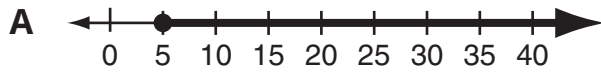**D** $m - 0.5$ and $m - \dfrac{1}{2}m$

5. During a trivia game, a player receives 2 points for each correct answer and $-\dfrac{1}{2}$ point for each incorrect answer. During round 1, Annette answers 5 questions correctly and 6 questions incorrectly.

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What is Annette's score at the end of round 1?

A −3 points

B −1 point

C 7 points

D 13 points

GO ON

6. Harry raised $10 for each kilometer he walked in a walkathon. His goal was to raise at least $300 on Saturday and Sunday. Harry raised $50 on Saturday.

Which graph shows the distances, in kilometers, that Harry could have walked on Sunday to reach his goal?

A, B, C, D number lines from 0 to 40 in increments of 5:

A — closed point at 5, shaded to the right
B — closed point at 25, shaded to the right
C — closed point at 30, shaded to the right
D — closed point at 35, shaded to the right

7. Students in a middle school entered their name in a raffle. The number of students in each grade level is shown in this bar graph.

Middle School Raffle

Key

Girls ☐   Boys ■
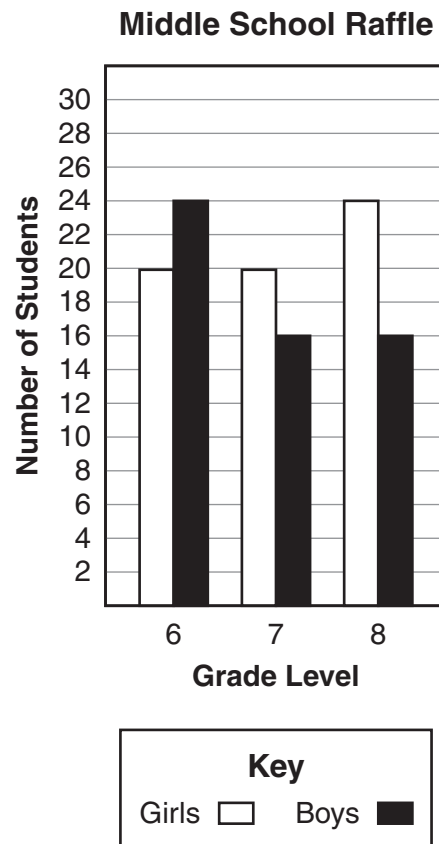
Each student could enter his or her name only once. One student who entered the raffle will be selected at random.

What is the probability that the student selected will be a seventh-grade student? Use words or numbers to justify your answer.

GO ON →

8. Two points are shown on this number line.
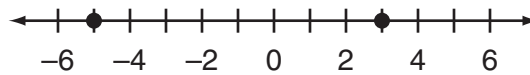
Which expression represents the distance between the two points?

A $|-5|-|3|$

B $|3|-|-5|$

C $|-5-3|$

D $|3-5|$

Use the information below to answer questions 9 and 10.

Penelope won a contest. For her prize, she gets to reach into a bag of envelopes and take one envelope without looking. Each envelope has a cash prize. The bag contains these envelopes:

- 100 envelopes with $10
- 50 envelopes with $50
- 25 envelopes with $100
- 15 envelopes with $200
- 10 envelopes with $500
- 1 envelope with $1,000

9. Penelope thinks that the probability of getting an envelope that contains $10 is more likely than not. Which statement **best** explains whether Penelope is correct?

   A No, the probability that she will get an envelope with $10 is less than 0.5.

   B Yes, the probability that she will get an envelope with $10 is less than 0.5.

   C No, the probability that she will get an envelope with $10 is greater than 0.5.

   D Yes, the probability that she will get an envelope with $10 is greater than 0.5.

10. Penelope claims this expression represents the probability that she will get an envelope with at least $500.

$$\frac{10}{100+50+25+15+1}$$

Is Penelope's claim true?

   A Yes, her claim is true.

   B No, she should add 1 to the numerator.

   C No, she should add 1 to the numerator and 10 to the denominator.

   D No, she should add 1 to the numerator and subtract 1 from the denominator.

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GO ON

11. The motion of a snail is shown on this graph.
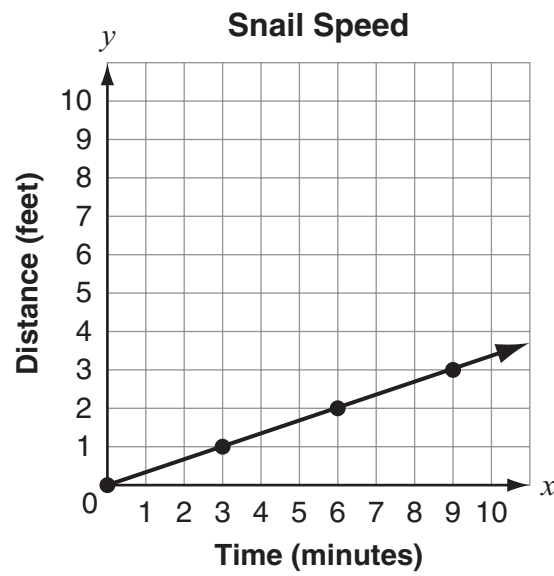
Snail Speed

What is the speed of the snail's motion?

A   0 feet per minute

B $\frac{1}{3}$ foot per minute

C $\frac{1}{2}$ foot per minute

D   3 feet per minute

GO ON

12. In $\frac{1}{2}$ minute, Tamara's car traveled $\frac{3}{4}$ kilometer.

What was the rate, in kilometers per minute, of Tamara's car?

A $\frac{3}{8}$ kilometer per minute

B $\frac{2}{3}$ kilometer per minute

C $1\frac{1}{4}$ kilometers per minute

D $1\frac{1}{2}$ kilometers per minute

13. Thomas runs a 12.5-kilometer road race. There is water available for the runners every 2.5 kilometers except at the start.

How many water stops are there along the race?

A 5

B 6

C 10

D 15

GO ON

14. It costs Jan's family $87 to rent 3 bikes for 4 hours. The cost includes a $5 fee for each bike rental plus an hourly rate.

Which method can be used to check that the hourly rate is $6?

A Multiply $6(4)$. Then add 5 to the product.

B Multiply $6(4)$. Then add $3(5)$ to the product.

C Multiply $3(6)(4)$. Then add 5 to the product.

D Multiply $3(6)(4)$. Then add $3(5)$ to the product.

15. An expression is shown.

$$32x - 120y$$

Which expression is equivalent?

A $8(4x - 15y)$

B $8(4 - 15)xy$

C $8y(4x - 15)$

D $8x(4 - 15y)$

16. Kevin and Marlow were at track practice. One lap around the track is $\frac{2}{5}$ kilometer.

- Kevin ran 2 laps in 4 minutes.

- Marlow ran 3 laps in 5 minutes.

Which student ran faster, in kilometers per minute?

A Kevin ran faster because $\frac{1}{5} < \frac{6}{25}$.

B Marlow ran faster because $4\frac{1}{6} < 5$.

C Kevin ran faster because $10 < 12\frac{1}{2}$.

D Marlow ran faster because $1\frac{2}{3} < 2$.

17. Nadine is researching summer camps. This double box-and-whisker plot shows the distribution of positive feedback for the same activities at two different camps.

Positive Survey Feedback
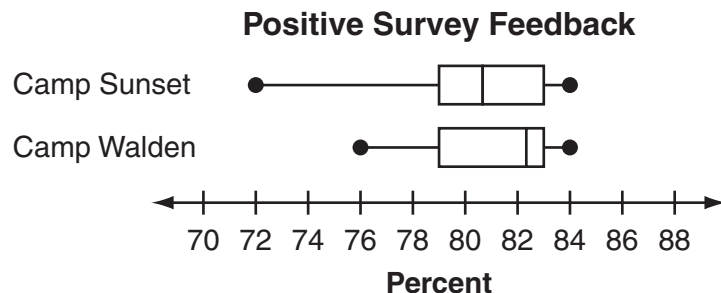
Based on these data alone, which camp should Nadine attend and why?

A Camp Sunset, because the feedback for the activities is more consistent and she is more likely to have a positive experience with her activities there

B Camp Sunset, because the feedback for the activities is less consistent, so she is more likely to have a positive experience with her activities there

C Camp Walden, because the feedback for the activities is more consistent and she is more likely to have a positive experience with her activities there

D Camp Walden, because the feedback for the activities is less consistent, so she is more likely to have a positive experience with her activities there

This question has three parts. Be sure to answer all parts of the question.

18. The length of a rectangle is 4 units more than 3 times its width.

a. Write an equation in terms of the width, w, that represents the perimeter, P, of the rectangle. Write your equation in its simplest form.

b. If the width of the rectangle is 10 units, what is the perimeter, in units? Show your work or explain how you know.

A second rectangle has a length of 15 units and a perimeter of 64 units.

c. What is the width, w, in units, of the second rectangle? Use an equation to show your work or explain how you know.

GO ON

19. There are 12 boys and 14 girls in Mr. Rowe's class. Each week, Mr. Rowe puts pieces of paper with each student's name in a box and randomly pulls one out. The chosen student spins the arrow on the spinner shown.
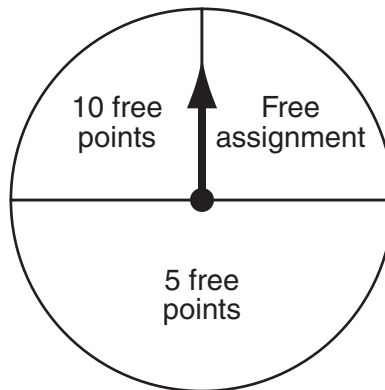
Which expression can be used to find the probability that this week a boy will be chosen and the arrow will land on "Free assignment"?

A $\dfrac{12}{26} \times \dfrac{1}{4}$

B $\dfrac{12}{26} + \dfrac{1}{4}$

C $\dfrac{12}{14} \times \dfrac{1}{4}$

D $\dfrac{12}{14} + \dfrac{1}{4}$

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GO ON →

20. Mario has a statue that consists of $\frac{1}{10}$ tin and $\frac{1}{4}$ lead. The rest of the statue consists of copper.

What fraction of the statue consists of copper?

A $\frac{6}{7}$

B $\frac{7}{10}$

C $\frac{13}{14}$

D $\frac{13}{20}$

21. This graph shows the relationship between the time, in seconds, and the height of the bottom of an elevator, in meters, as the elevator moves upward.

Elevator Movement
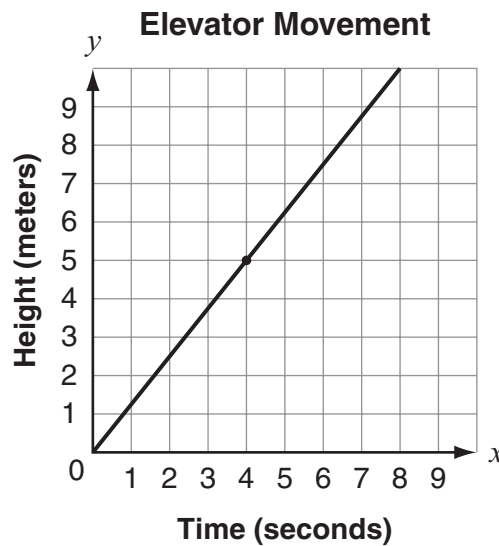
What does the point $(4, 5)$ on this graph represent?

A   The bottom of the elevator is at a height of 4 meters after moving upward for 5 seconds.

B   The bottom of the elevator is at a height of 5 meters after moving upward for 4 seconds.

C   The elevator is moving upward at a speed of 4 meters per second after 5 seconds.

D   The elevator is moving upward at a speed of 5 meters per second after 4 seconds.

GO ON

22. Samantha has $22 to buy one binder and some packages of paper. One binder costs $4, and packages of paper cost $3 each. Which inequality can be used to find p, the number of packages of paper Samantha can buy along with the binder?

   A $4p + 3 \leq 22$

   B $4p + 3 \geq 22$

   C $4 + 3p \leq 22$

   D $4 + 3p \geq 22$

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STOP

Mathematics Session 2

23. Which sentence describes a proportional relationship between the two sets of values?

   A   Jarrod paid $17.00 for 2 ink cartridges and $59.50 for 7 ink cartridges.

   B   Victoria paid $14.40 to mail 3 packages and $21.60 to mail 5 packages.

   C   Sandra downloaded 8 songs in 12 minutes and 14 songs in 22 minutes.

   D   Michael read 18 pages in 9 minutes and 36 pages in 20 minutes.

Use the information below to answer questions 24 and 25.

This scale drawing shows the side and rear views of the storage space of a rental truck.

Side View — 6 in., $\frac{3}{4}$ in., 2 in., Top, Bottom, $5\frac{1}{4}$ in.

Rear View — $1\frac{7}{8}$ in., 2 in.

Scale
1 inch : 4 feet

GO ON
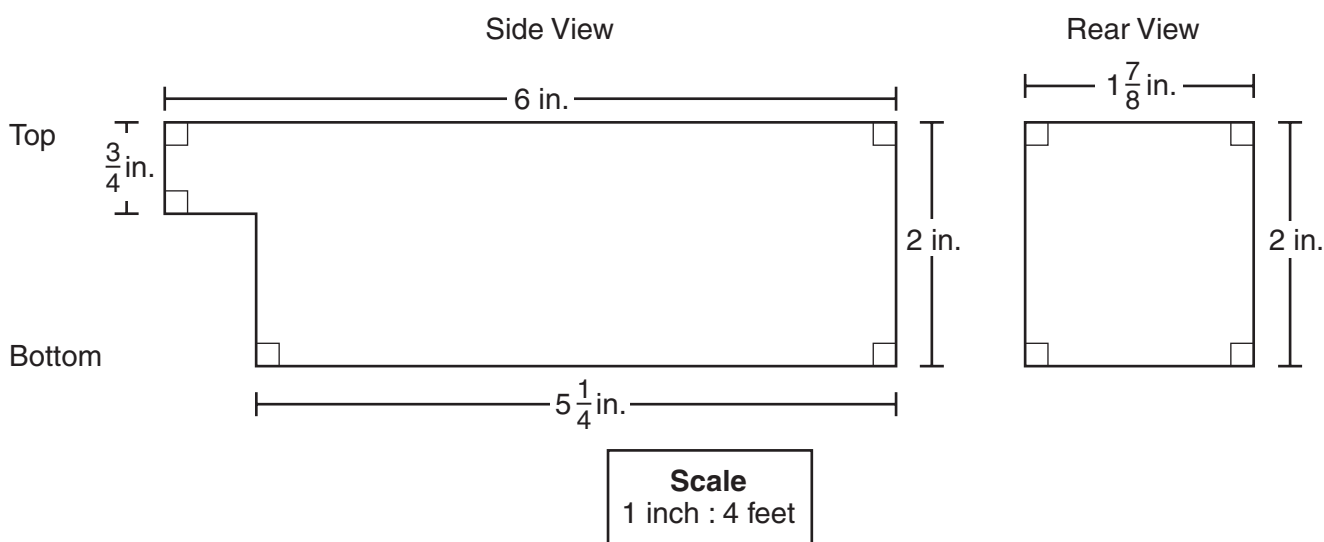
24. Tristan is going to determine the actual floor area of the storage space of the truck.

Based on the dimensions in the scale drawing, what units should he use for the floor area of the storage space?

A feet

B inches

C square feet

D square inches

25. Barney wrote this expression for the volume, in cubic feet, of the storage space.

$$(4)(4)(4)[6(2) - \frac{3}{4}(1\frac{1}{4})]$$

Four students evaluated Barney's expression. Which student's statement about Barney's expression for the volume of the storage space is true?

A Albert says the expression is correct.

B Felicia says the expression is missing a factor of $(4)(2)(1\frac{7}{8})$.

C Leia says the expression is missing a factor of $(2)(1\frac{7}{8})$.

D Trey says the expression is missing a factor of $1\frac{7}{8}$.

GO ON

26. Todd wants to buy a bagel with a filling and a jam.

- The bagel choices are plain or wheat.

- The filling choices are cream cheese or almond butter.

- The jam choices are grape or strawberry.

Todd made this tree diagram to show the probability of randomly choosing a bagel, filling, and jam.

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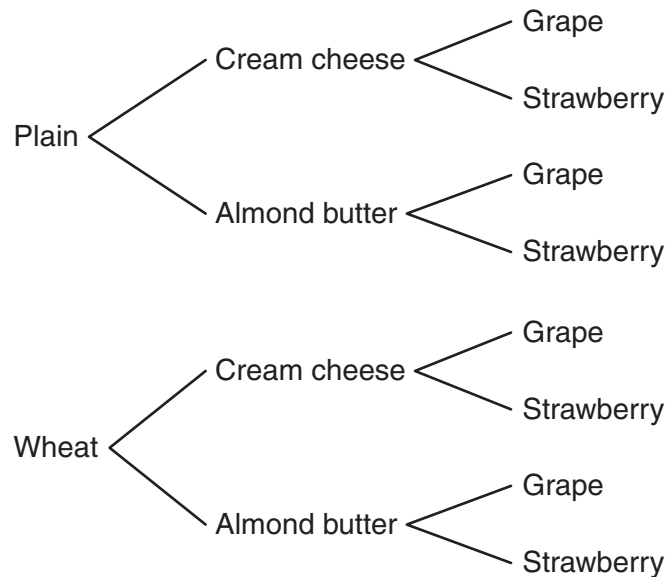
What is the probability that Todd will choose a bagel with cream cheese and strawberry jam?

A $\frac{1}{8}$

B $\frac{1}{4}$

C $\frac{1}{2}$

D $\frac{3}{4}$

GO ON

27. Four students conducted a survey about sports preferences at their middle school. Each student asked participants in their survey the same questions.

- Brian surveyed all the students in school clubs.

- Ellen surveyed 10 different students in all the classes that he had in the morning.

- Karter surveyed all the seventh graders who were eating sandwiches in the cafeteria at lunchtime.

- Olivia surveyed each fifth person from a list containing alphabetized names of the students in the school.

Which student's survey would be **most** representative of sports preferences at the school?

A   Brian's survey

B   Ellen's survey

C   Karter's survey

D   Olivia's survey

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28. Consider this cube.
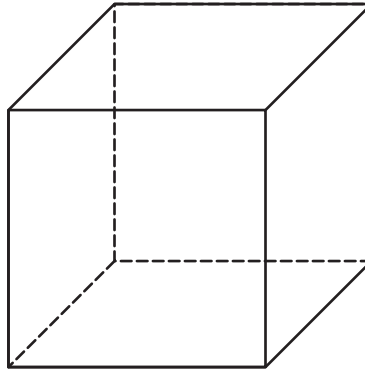
Which figure **cannot** be created from a plane section of the cube?

A   triangle

B   hexagon

C   octagon

D   trapezoid

This question has two parts. Be sure to answer all parts of the question.

29. Paul drew two circles. One circle has a radius of 8 centimeters and the other has a radius of 12 centimeters, as shown.
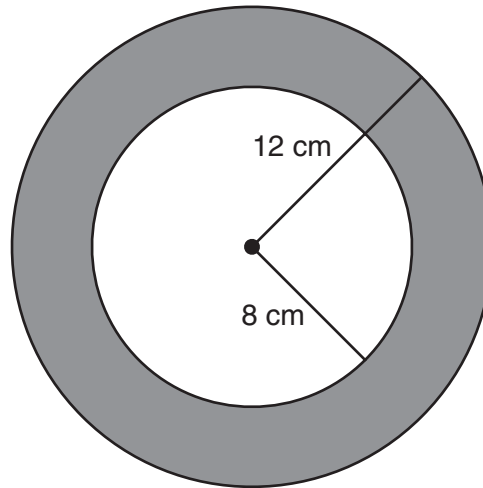
Paul says that the area of the shaded section between the two circles is 16π square centimeters because $A = \pi(12-8)^2 = 16\pi$.

a. Use words or numbers to explain the error that Paul made in his calculation.

b. What is the area, in square centimeters, of the shaded area between the two circles? Use 3.14 for π. Show your work or explain how you know.

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GO ON →

30. A local bowling team participates in a two-day tournament and records the scores for each team member on both days. The scores for both days are represented in these box-and-whisker plots.

Bowling Team Scores
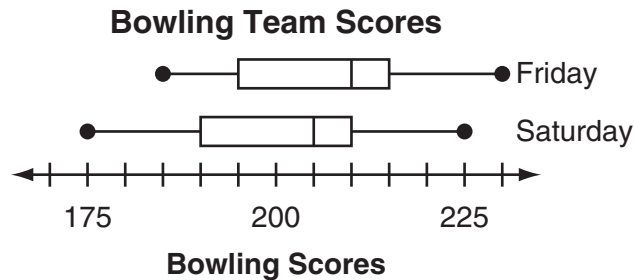
Based on the box-and-whisker plots, which statement is true?

A The scores on Friday and the scores on Saturday have the same median and interquartile range.

B The scores on Friday have a greater median and a greater interquartile range than the scores on Saturday.

C The scores on Friday have a greater interquartile range than the scores on Saturday, but both data sets have the same median.

D The scores on Friday have a greater median than the scores on Saturday, but both data sets have the same interquartile range.

GO ON

31. This graph shows the cost of renting a canoe.

Canoe Rental Cost
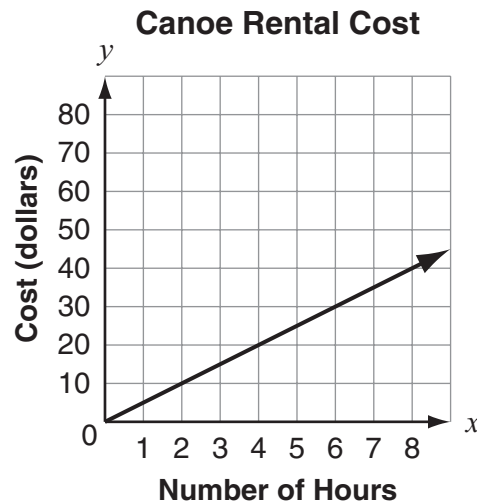
Based on the graph, which statements are true about the cost of renting a canoe? Select the **three** correct answers.

A It costs $5 to rent a canoe for 1 hour.

B It costs $2 to rent a canoe for 10 hours.

C The unit rate is 5 hours of rental per dollar.

D The constant of proportionality for the relationship is 5.

E The cost of the rental is proportional to the number of hours rented.

32. A store receives a shipment of boxes of tea. The total mass of the shipment is 6 kilograms.

- Each box of tea has a mass of 0.040 kilogram.

- Boxes of green tea make up **18%** of the shipment.

How many boxes of green tea were in the shipment?

A 7

B 27

C 58

D 108

GO ON

33. A large wheel has a diameter of approximately 13 feet, as shown.
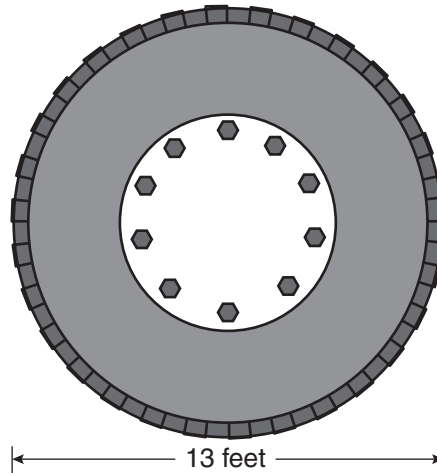
13 feet

What is the approximate distance, in feet, traveled after one complete rotation of this wheel? Use 3.14 for π.

A 20 feet

B 41 feet

C 82 feet

D 133 feet

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34. An ice-cream shop manager lowered the price for a single scoop of ice cream from $2.50 to $2.00.

What is the percent of decrease in the price?

A 20%

B 25%

C 50%

D 80%

GO ON

35. A total of 800 people register to participate in a race. Each participant is given a colored T-shirt to wear in the race. Before the race starts, Aiden records the colors of 32 randomly selected participants' shirts. The results are shown in this table.

Race Shirts

Color	Number of Participants
Red	4
Yellow	12
Purple	10
Orange	6

Based on the results in the table, what is the total number of participants expected to have yellow shirts?

A 200

B 300

C 375

D 480

This question has three parts. Be sure to answer all parts of the question.

36. A shoe company has this monthly budget for expenses:

- salaries: $\frac{2}{5}$ of total expenses

- rent: $\frac{1}{3}$ of total expenses

- utilities: $\frac{1}{6}$ of total expenses

The remaining fraction of the total monthly budget for expenses is applied toward miscellaneous expenses.

a. What fraction of the total monthly budget for expenses is applied toward miscellaneous expenses? Use words or numbers to justify your answer.

In April, the budget for miscellaneous expenses was $8,520.

b. What was the total amount, in dollars, budgeted for all the expenses in April? Use words or numbers to justify your answer.

In May, the budget for salaries was $45,000.

c. What was the total amount, in dollars, budgeted for **utilities** in May? Use words or numbers to justify your answer.

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37. This graph shows the relationship between the time Alec reads and the number of words he reads.

Amount Alec Reads

Number of Minutes Read
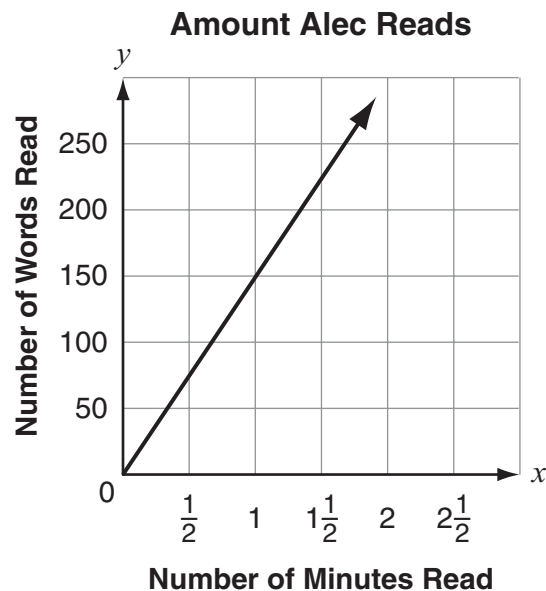
Which point on the graph represents the number of words Alec reads per minute?

A $(1, 100)$

B $(1, 150)$

C $(100, 1)$

D $(150, 1)$

38. Cho left a 20% tip on her $25.70 dinner bill.

Which expression does **not** represent the total amount that Cho paid?

A $1.2(25.70)$

B $25.70(\dfrac{20}{100})$

C $25.70 + 5.14$

D $25.70 + 25.70(0.2)$

GO ON

Use the problem below to answer questions 39 and 40.

Kate bought a sketch notebook, a box of 12 colored pencils, a package of 15 erasers, and a box of 13 pastel chalk sticks.

- The box of colored pencils cost $9.01.

- The package of erasers cost $0.98.

- The box of pastel chalk sticks cost $5.01.

- The sales tax rate for all the items is 8%.

- The amount of sales tax was $1.62.

- The total cost was $21.87.

What is the cost of the sketch notebook?

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39. What information is **not** necessary to solve the problem?

    A   the sales tax rate

    B   the cost of the package of 15 erasers

    C   the cost of the box of 12 colored pencils

    D   the cost of the box of 13 pastel chalk sticks

40. In Heather's solution to the problem, she wrote and solved an equation. Her work is shown.

- Step 1:
  $1.08(x + 9.01 + 0.98 + 5.01) = 21.87$

- Step 2:
  $1.08x + 1.08(9.01) + 1.08(0.98) + 1.08(5.01) = 21.87$

- Step 3:
  $1.08x + 9.73 + 1.06 + 5.41 = 21.87$

- Step 4:
  $1.08x = 5.67$

- Step 5:
  $x = 5.25$

The cost of the sketch notebook is $5.25.

Is Heather's solution correct?

A Yes, it is correct.

B No, because in step 5 the 5.25 should be 6.12.

C No, because in step 4 the 5.67 should be 1.62.

D No, because in step 2 only the x should be multiplied by 1.08.

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STOP

NM-MSSA MATH
PRACTICE TEST ANSWER KEY
Grade 7

Item Number	Key	Standards
1	B	**7.NS.A.2** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **7.NS.A.2.B** Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.
2	C	**7.G.B.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
3	D	**7.G.B.6** Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
4	B	**7.EE.A.2** Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. *For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."*
5	C	**7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*
6	B	**7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. **7.EE.B.4.B** Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.

Practice Test Answer Key • Grade 7 Math

Item Number	Key	Standards
7		**7.SP.C.7** Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. **7.SP.C.7.A** Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*
8	C	**7.NS.A.1** Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram. **7.NS.A.1.C** Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
9	A	**7.SP.C.5** Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
10	C	**7.SP.C.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **7.SP.C.8.A** Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
11	B	**7.RP.A.2** Recognize and represent proportional relationships between quantities. **7.RP.A.2.B** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
12	D	**7.RP.A.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.*
13	A	**7.NS.A.2** Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. **7.NS.A.2.C** Apply properties of operations as strategies to multiply and divide rational numbers.

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Item Number	Key	Standards
14	D	**7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. **7.EE.B.4.A** Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?
15	A	**7.EE.A.1** Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
16	A	**7.RP.A.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.*
17	C	**7.SP.B.4** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*
18		**7.EE.B.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. **7.EE.B.4.A** Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*
19	A	**7.SP.C.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **7.SP.C.8.C** Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*
20	D	**7.NS.A.3** Solve real-world and mathematical problems involving the four operations with rational numbers.[1] [1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions.

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Item Number	Key	Standards
21	B	7.RP.A.2 Recognize and represent proportional relationships between quantities. 7.RP.A.2.D Explain what a point (*x*, *y*) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r*) where *r* is the unit rate.
22	C	7.EE.B.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. 7.EE.B.4.B Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. *For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.*
23	A	7.RP.A.2 Recognize and represent proportional relationships between quantities.
24	C	7.G.A.1 Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
25	D	7.G.B.6 Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
26	B	7.SP.C.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. 7.SP.C.8.B Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event.
27	D	7.SP.A.1 Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
28	C	7.G.A.3 Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
29		7.G.B.4 Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

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Item Number	Key	Standards
30	D	**7.SP.B.4** Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. *For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*
31	A,D,E	**7.RP.A.2** Recognize and represent proportional relationships between quantities. **7.RP.A.2.B** Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
32	B	**7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*
33	B	**7.G.B.4** Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
34	A	**7.RP.A.3** Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
35	B	**7.SP.A.2** Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*
36		**7.EE.B.3** Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.*

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Item Number	Key	Standards
37	B	7.RP.A.2 Recognize and represent proportional relationships between quantities. 7.RP.A.2.D Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points $(0, 0)$ and $(1, r)$ where r is the unit rate.
38	B	7.EE.A.2 Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."
39	A	7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.[1] [1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions.
40	A	7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.[1] [1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions.

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#7

Response Processing:

Rubric Block: Author, Scorer, Test-constructor, Tutor
Concepts and Procedures Scoring Rubric:

Score	Description
2	Student earns 2 points.
1	Student earns 1 point.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

2 points   for correct answer, $\dfrac{36}{120}$ or equivalent, with sufficient work or explanation to indicate understanding of developing a

uniform probability model by assigning equal probability to all outcomes, and using the model to determine probabilities of events

OR

1 point   for correct answer with insufficient work or explanation

OR

for sufficient work or explanation to indicate understanding of developing a uniform probability model by assigning equal probability to all outcomes, and using the model to determine probabilities of events with incorrect or no answer

Rubric Block: Author, Scorer, Test-constructor, Tutor
Mathematical Practices Scoring Rubric:

Score	Description
1	Student earns 1 point.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

1 point   for interpreting and analyzing a model (demonstrates understanding and using information from the model)

Rubric Block: Author, Scorer, Test-constructor, Tutor
Exemplary Response:

The seventh grade has 36 students and there is a total of 120 students at the school. Therefore, the probability that the student chosen is a seventh-grade student is $\dfrac{20 + 16}{20 + 24 + 20 + 16 + 24 + 16} = \dfrac{36}{120}$.

Practice Test Answer Key • Grade 7 Math

#18

Response Processing:

Rubric Block: ID: 1 Author, Scorer, Test-constructor, Tutor
Concepts and Procedures Scoring Rubric:

Score	Description
4	The student earns 4 points.
3	The student earns 3 points.
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response

Concepts and Procedures Training Notes:

Part a   1 point   for correct answer, **8w + 8**, or equivalent

Part b   2 points   for correct answer, **88** (units), or equivalent with sufficient work or explanation that indicates an understanding of how to solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$

           1 point   for correct answer with insufficient or no work or explanation shown

                 or

                 for appropriate strategy that indicates an understanding of how to solve word problems with incorrect or no answer

Part c   1 point   for correct answer, **17** (units), or equivalent

Rubric Block: ID:1 Author, Scorer, Test-constructor, Tutor
Mathematical Practices Scoring Rubric:

Score	Description
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response

Mathematical Practices Training Notes:

1 point   for abstracting a given situation and representing it symbolically (simplifying the equation to represent the perimeter of the rectangle in terms of its width in part (a))

1 point   for knowing and flexibly using different properties of operations (showing correct work or explanation in part (c))

Rubric Block: Author, Scorer, Test-constructor, Tutor
Exemplary Response:

a. $8w + 8$; The perimeter of any rectangle can be found using the equation $P = 2(l + W)$. Since the length of the rectangle is 4 more than 3 times its width, we can replace l with the expression $4 + 3w$, resulting in the equation $P = 2(4 + 3w + w)$. Simplifying this equation gives $P = 2(4 + 4w)$ or $P = 8 + 8w$.

b. 88 units; If the width of the rectangle is 10 units, then the perimeter can be found by solving the equation, $P = 8 + 8(10)$ and solving for P.

c. 17 units; I can use the equation $P = 2(l + w)$ and substitute 64 for P and 15 for l to get: $64 = 2(15 + w)$. Solving for w: $32 = 15 + w$, and $w = 17$.

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#29

Response Processing:

Rubric Block: ID:1 Author, Proctor, Scorer, Test-constructor, Tutor
Concepts and Procedures Scoring Rubric

Score	Description
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response

Concepts and Procedures Training Notes:

Part a   See Mathematical Practices scoring rubric and training notes.

Part b   2 points   for correct answer, **251.2** or 80π, or equivalent with sufficient work or explanation to indicate understanding or knowing the formulas for the area and circumference of a circle

       OR

       1 point   for correct answer with insufficient or no work or explanation

           OR

       for appropriate strategy that indicates understanding or knowing the formulas for the area and circumference of a circle with incorrect or no answer

Rubric Block: ID:1 Author, Proctor, Scorer, Test-constructor, Tutor
Mathematical Practices Scoring Rubric

Score	Description
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response

Mathematical Practices Training Notes:

1 point   for responding to the arguments of others (explaining the error that was made involves subtracting the radii of both circles and then squaring the result in part (a))

Rubric Block: Author, Scorer, Test-constructor, Tutor
Exemplary Response:

a. Paul used the difference of the radii to find the area when he needed to find the area of each circle separately and then find the difference.

b. The correct answer is the difference of the areas of the circles. The greater area minus the lesser area will yield the area between the circles: $A = \pi(12)2 - \pi(8)2 = 144\pi - 64\pi = 80\pi$ or 3.14(80) = 251.2 square centimeters.

Practice Test Answer Key • Grade 7 Math

#36

Response Processing:

Rubric Block: Author, Scorer, Test-constructor, Tutor
Concepts and Procedures Scoring Rubric

Score	Description
4	The student earns 6 points.
3	The student earns 4 or 5 points.
2	The student earns 2 or 3 points.
1	The student earns 1 point.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response

Training Notes:

Part a   2 points   for correct answer, $\dfrac{3}{30}$ or equivalent, with sufficient work or explanation to indicate understanding of solving multistep

real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically

OR

1 point   for correct answer with insufficient or no work or explanation

OR

for appropriate strategy that shows understanding of solving multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically with incorrect or no answer

Part b   2 points   for correct answer, **$85,200**, or a correct answer based on an incorrect answer in part (a) with sufficient work or explanation that shows understanding of solving multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically

OR

1 point   for correct answer or a correct answer based on an incorrect answer in part (a) with insufficient or no work or explanation

OR

for appropriate strategy that shows understanding of solving multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically with incorrect or no answer

Part c   2 points   for correct answer, **$18,750**, with sufficient work or explanation that shows understanding solving multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically

OR

1 point   for correct answer with insufficient or no work or explanation

OR

for appropriate strategy that shows understanding of solving multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically with incorrect or no answer

Practice Test Answer Key • Grade 7 Math

Rubric Block: Author, Scorer, Test-constructor, Tutor
Mathematical Practices Scoring Rubric:

Score	Description
2	The student earns 2 points.
1	The student earns 1 point.
0	The student earns 0 points.
Blank	No response

Training Notes:

1 point   for making sense of quantities (demonstrating understanding of the relationship between the fractional budgeted amounts)

1 point   for contextualizing (using the relationships between the fractional budgeted amounts, the total budget amount, and the individual budget amounts)

Rubric Block: Author, Scorer, Test-constructor, Tutor
Exemplary Response:

a. $\dfrac{2}{5} + \dfrac{1}{3} + \dfrac{1}{6} = \dfrac{12 + 10 + 5}{30} = \dfrac{27}{30} = \dfrac{9}{10}; \ 1 - \dfrac{9}{10} = \dfrac{1}{10}$

b. $85,200;$

$\dfrac{1}{10}x = 8,520$

$\left(\dfrac{10}{1}\right)\dfrac{1}{10}x = 8,520$

$x = 85,200$

c. $18,750;$

$\dfrac{2}{5}y = 45,000$

$\left(\dfrac{5}{2}\right)\dfrac{2}{5}y = 45,000\left(\dfrac{5}{2}\right)$

$y = 112,500$

$112,500 \cdot \dfrac{1}{6} = 18,750$