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New York State Testing Program

2017 Common Core Mathematics Test Book 2

Grade 8

May 2–4, 2017

Released Questions

Grade 8
2017 Common Core
Mathematics Test
Book 1
May 2–4, 2017

Grade 8 Mathematics Reference Sheet

CONVERSIONS

1 inch = 2.54 centimeters

1 meter = 39.37 inches

1 mile = 5,280 feet

1 mile = 1,760 yards

1 mile = 1.609 kilometers

1 kilometer = 0.62 mile

1 pound = 16 ounces

1 pound = 0.454 kilogram

1 kilogram = 2.2 pounds

1 ton = 2,000 pounds

1 cup = 8 fluid ounces

1 pint = 2 cups

1 quart = 2 pints

1 gallon = 4 quarts

1 gallon = 3.785 liters

1 liter = 0.264 gallon

1 liter = 1,000 cubic centimeters

FORMULAS

Triangle

$$A = \frac{1}{2}bh$$

Parallelogram

$$A = bh$$

Circle

$$A = \pi r^2$$

Circle

$$C = \pi d \text{ or } C = 2\pi r$$

General Prisms

$$V = Bh$$

Cylinder

$$V = \pi r^2 h$$

Sphere

$$V = \frac{4}{3}\pi r^3$$

Cone

$$V = \frac{1}{3}\pi r^2 h$$

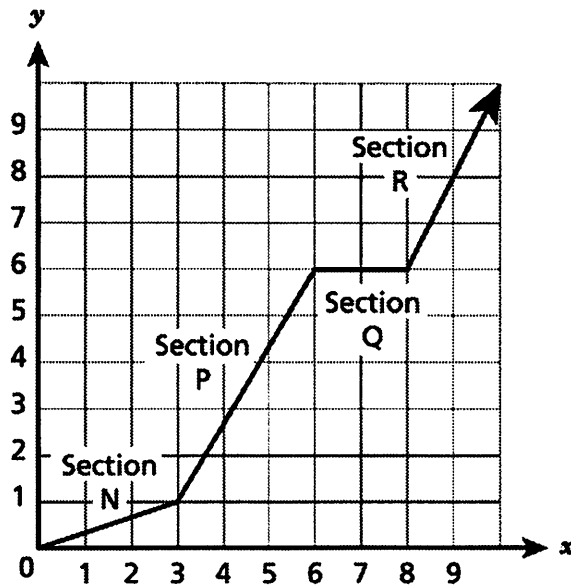
Pythagorean Theorem

$$a^2 + b^2 = c^2$$

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27

The graph of a function is shown below.



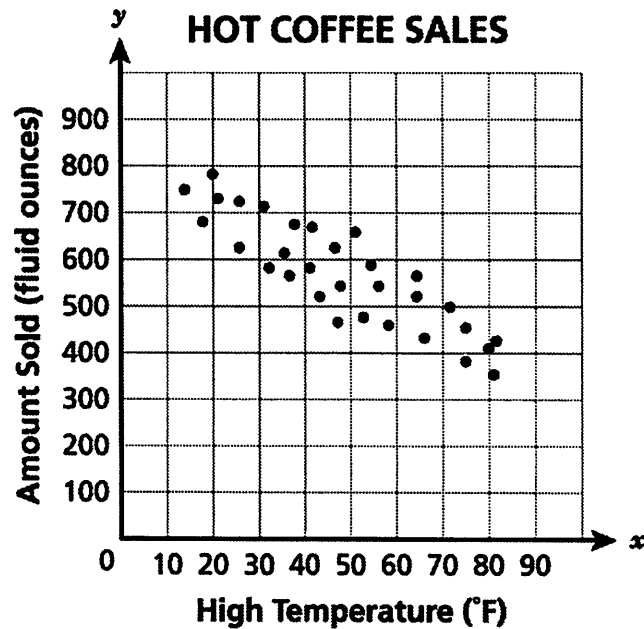
Which statement is true about a section of the graph?

- A In Section N, the function is linear and decreasing.
- B In Section P, the function is linear and increasing.
- C In Section Q, the function is nonlinear and decreasing.
- D In Section R, the function is nonlinear and increasing.

GO ON

28

The owner of a coffee shop compared the amount of hot coffee per day, in fluid ounces, sold and the daily high temperature, in degrees Fahrenheit, per day. Her data are shown in the scatter plot below.



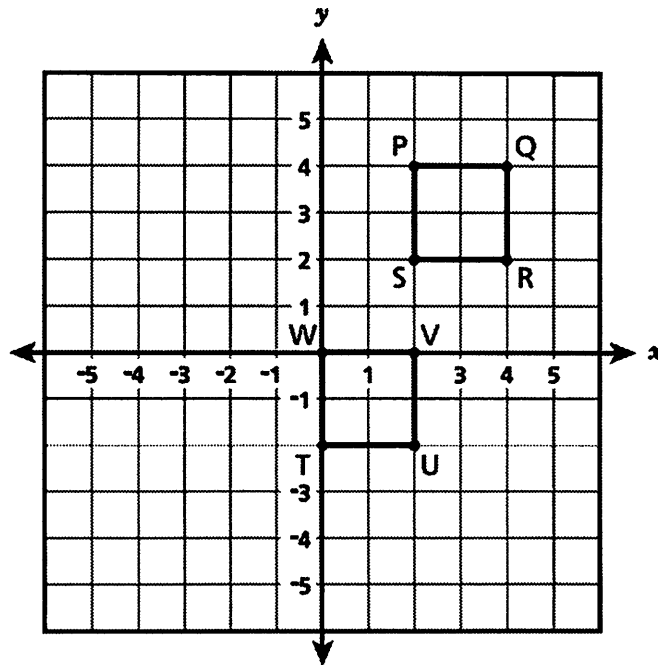
If these data are modeled by the line $y = -5.9x + 850$, which statement best describes a valid prediction the owner could make?

- A For each temperature increase of 10°F , the shop can expect to sell about 60 fluid ounces more hot coffee.
- B For each temperature decrease of 10°F , the shop can expect to sell about 6 fluid ounces more hot coffee.
- C On a day with a high temperature of 0°F , the shop can expect to sell about 145 fluid ounces of hot coffee.
- D On a day with a high temperature of 0°F , the shop can expect to sell about 850 fluid ounces of hot coffee.

GO ON

29

Squares PQRS and TUVW are shown below.

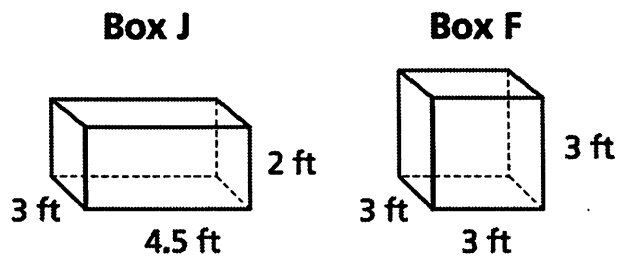


Which sequence of transformations of square PQRS shows that square PQRS is congruent to square TUVW?

- A a translation 2 units up and 2 units to the right, then a reflection over the x -axis
- B a translation 2 units up and 2 units to the right, then a reflection over the y -axis
- C a translation 2 units down and 2 units to the left, then a reflection over the x -axis
- D a translation 2 units down and 2 units to the left, then a reflection over the y -axis

GO ON

- 30 Two types of shipping boxes are shown below.



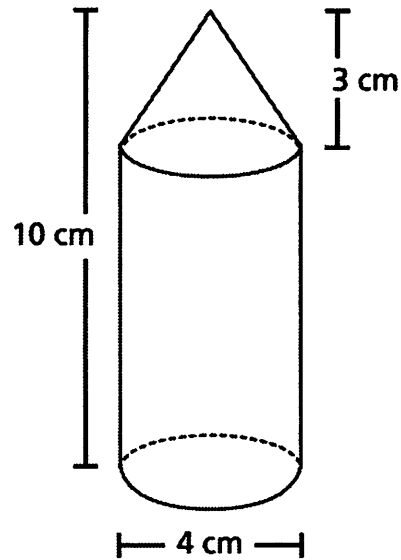
What is the difference in the surface areas, in square feet, of the two boxes?

- A 2
B 3
C 21
D 30
- 31 Which expression is equivalent to $2^2 \cdot \frac{2}{2^4}$?

- A 2^{-2}
B 2^{-1}
C 2^6
D 2^7

32

The object below was made by placing a cone on top of a cylinder. The base of the cone is congruent to the base of the cylinder.



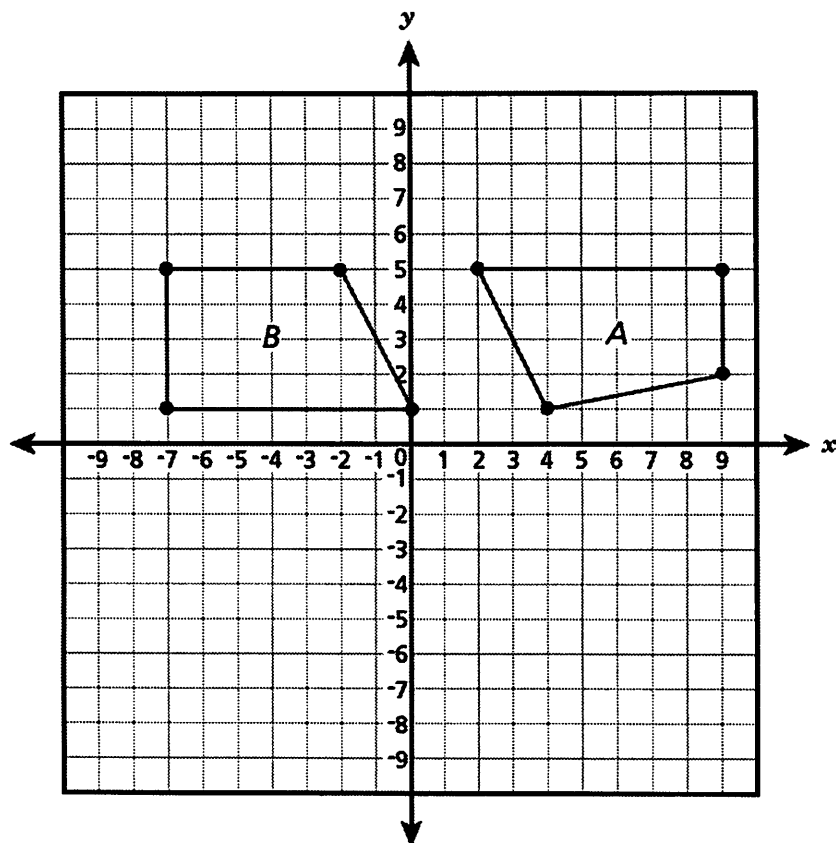
What is the volume, in cubic centimeters, of the object?

- A 32π
- B 40π
- C 44π
- D 128π

GO ON

34

Lily wants to define a transformation (or series of transformations) using only rotations, reflections, or translations that takes Figure A to Figure B.



Which statement about the transformation that Lily wants to define is true?

- A It can be defined with two reflections.
- B It can be defined with one rotation and one translation.
- C It cannot be defined because Figure A and Figure B are not congruent.
- D It cannot be defined because the longest side of Figure B is on the bottom.

GO ON

35

What is the solution to the system of equations below?

$$2x + 3y = 6$$

$$x - 3y = 9$$

A $\left(-1, \frac{8}{3}\right)$

B $(-3, -4)$

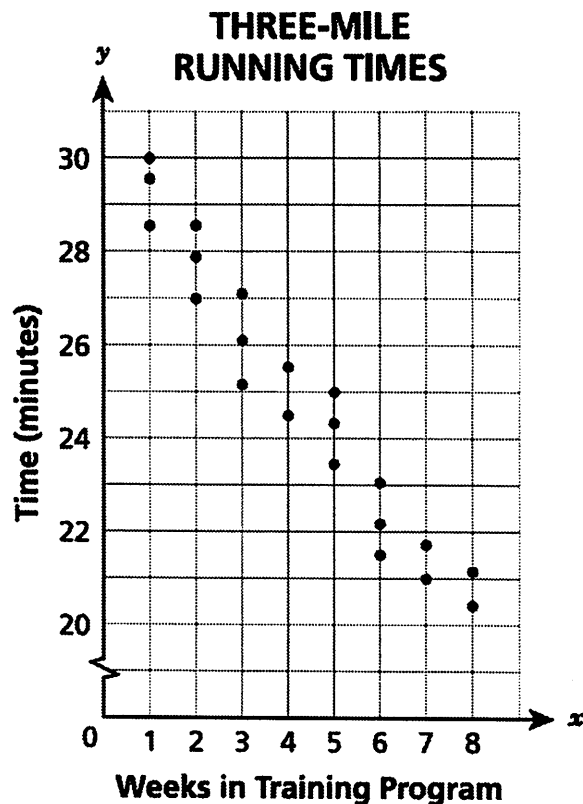
C $\left(5, -\frac{4}{3}\right)$

D $\left(8, -\frac{1}{3}\right)$

GO ON

36

As part of a training program for a triathlon, Marcie completes a three-mile run a few times each week. The scatter plot below shows the times in which Marcie completes this run for each week that she has been in the training program.



Based on these data, which statement best describes the relationship between the number of weeks Marcie has been in the training program and her running times?

- A There is a negative linear association with no outliers.
- B There is a negative linear association with one outlier.
- C There is a positive linear association with no outliers.
- D There is a positive linear association with one outlier.

GO ON

37

What is the solution to the equation below?

$$5c + 4 = 2(c - 5)$$

A $c = -4\frac{2}{3}$

B $c = -3$

C $c = -2$

D $c = -\frac{1}{3}$

38

Which statement best explains whether these ordered pairs represent a function?

$$(-4, 2), (6, 7), (-8, 3), (9, 10), (12, 14), (6, 9)$$

- A The ordered pairs represent a function because no output values are repeated.
- B The ordered pairs represent a function because each output value is greater than each input value.
- C The ordered pairs do not represent a function because one input value has two different output values.
- D The ordered pairs do not represent a function because the difference between the input and output of each ordered pair is not the same.

GO ON

39 The amount of revenue in dollars, y , that Jason receives from selling x posters is given by the equation $y = 4x$. The cost of producing x posters is given by the equation $y = \frac{1}{2}x + 280$. How many posters does Jason need to sell so that the cost and revenue are equal?

- A 40
- B 80
- C 140
- D 320

40 A car traveled 36 miles in 45 minutes. The car traveled at a constant speed. If the car continues to travel at this rate, which equation can be used to determine y , the total number of miles the car will travel, in x hours?

- A $y = 48x$
- B $y = x + 48$
- C $48y = x$
- D $48 + y = x$

GO ON

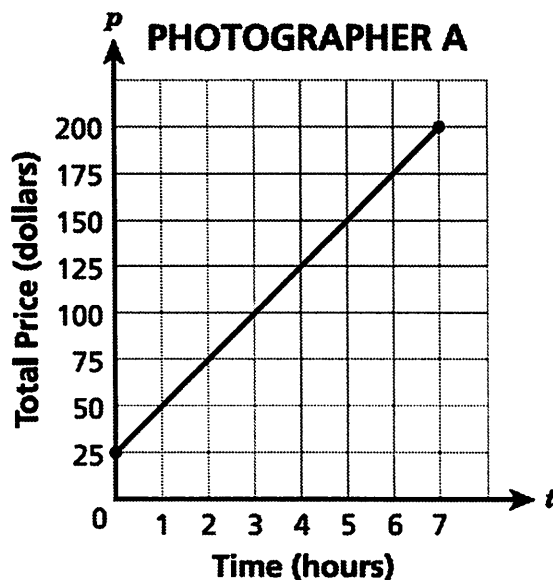
GO ON

The mass of a dust particle is approximately 7.5×10^{-10} kilograms and the mass of an electron is 9.1×10^{-31} kilograms. Approximately how many electrons have the same mass as one dust particle?

- A 1.21×10^{20}
B 1.21×10^{21}
C 8.24×10^{20}
D 8.24×10^{21}

43

Two photographers offer different pricing plans for their services. The graph below models the prices Photographer A charges. The table below shows the prices Photographer B charges. Each photographer charges a one-time equipment fee and an hourly rate.



PHOTOGRAPHER B

Time (hours)	2	4
Total Price	\$80	\$110

Which statement about the two pricing plans is true?

- A Photographer A charges \$15 per hour more than Photographer B.
- B Photographer B charges \$15 per hour more than Photographer A.
- C Photographer A's equipment fee is \$25 less than Photographer B's.
- D Photographer B's equipment fee is \$25 less than Photographer A's.

44

Acute $\triangle ABC$ is rotated about a point and then dilated by a scale factor of $\frac{1}{2}$ to produce $\triangle A'B'C'$. Which statement correctly compares $\triangle A'B'C'$ to $\triangle ABC$?

- A The angle measures and side lengths of $\triangle A'B'C'$ are half the size of those of $\triangle ABC$.
- B The angle measures of $\triangle A'B'C'$ are the same as those of $\triangle ABC$, but the side lengths of $\triangle A'B'C'$ are half the size of those of $\triangle ABC$.
- C The angle measures of $\triangle A'B'C'$ are the same as those of $\triangle ABC$, but the side lengths of $\triangle A'B'C'$ are twice the size of those of $\triangle ABC$.
- D The angle measures of $\triangle A'B'C'$ depend on the angle of rotation, but the side lengths of $\triangle A'B'C'$ are half the size of those of $\triangle ABC$.

45

Which expression is equivalent to $(4.5 \times 10^2) + (6.0 \times 10^3)$ and written in scientific notation?

- A 1.05×10^6
- B 2.7×10^6
- C 6.45×10^3
- D 10.5×10^5

GO ON

46 The points $(2, -2)$ and $(-4, 13)$ lie on the graph of a linear function of x . Which point also lies on the graph of this function?

A $(-6, 18)$

B $(-1, 5)$

C $(7, 14.5)$

D $(13, -4)$

47 What value for the constant, h , in the equation shown below will result in an infinite number of solutions?

$$6x + 18 = h(3x + 9)$$

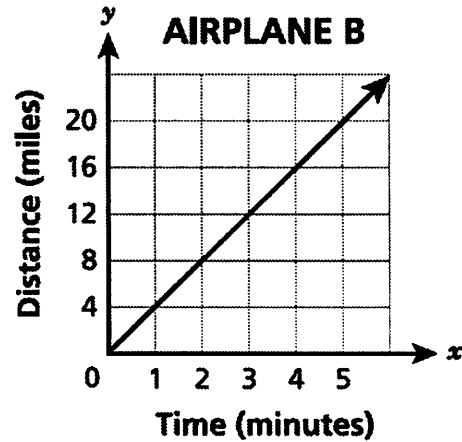
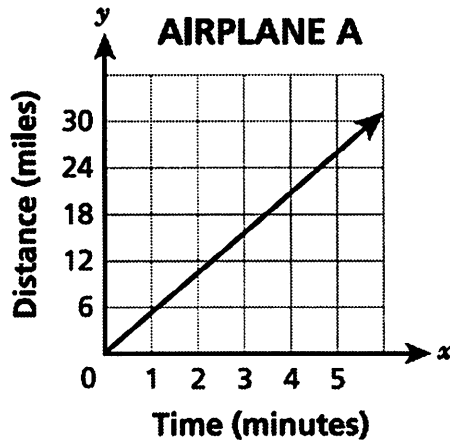
A -2

B -3

C 2

D 3

The graphs below show the relationship between elapsed time and distance traveled by airplane A and airplane B after each airplane reaches its cruising speed.



Airplane C is traveling at a different cruising speed. The equation $y = \frac{27}{6}x$ can be used to determine y , the number of miles traveled by airplane C in x minutes. Which statement accurately compares the cruising speed of airplane C to airplanes A and B?

- A The cruising speed of airplane C is less than the cruising speeds of both airplanes A and B.
- B The cruising speed of airplane C is greater than the cruising speeds of both airplanes A and B.
- C The cruising speed of airplane C is greater than the cruising speed of airplane A and less than the cruising speed of airplane B.
- D The cruising speed of airplane C is less than the cruising speed of airplane A and greater than the cruising speed of airplane B.

51

Two transformations are performed on a figure on a coordinate plane. The first transformation is a translation 8 units to the left. Which second transformation will result in an image that is similar to, but not congruent to, the original figure?

- A a clockwise rotation of 90° about the center
- B a clockwise rotation of 180° about the center
- C a dilation by a scale factor of 1 with the origin as the center of dilation
- D a dilation by a scale factor of $\frac{1}{2}$ with the origin as the center of dilation

STOP