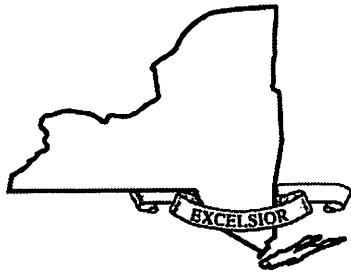


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# ***New York State Testing Program***

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## **2017 Common Core Mathematics Test Book 1**

# **Grade 8**

**May 2–4, 2017**

**Released Questions**

The scoring rubric for short and extended constructed-response questions can be found in the grade-level Educator Guides at <https://www.engageny.org/resource/test-guides-english-language-arts-and-mathematics>.

### **New York State P-12 Learning Standards Alignment**

The alignment(s) to the New York State P-12 Learning Standards for Mathematics is/are intended to identify the primary analytic skills necessary to successfully answer each question. However, some questions measure proficiencies described in multiple standards, including a balanced combination of procedure and conceptual understanding. For example, two-point and three-point constructed-response questions require students to show an understanding of mathematical procedures, concepts, and applications.

### ***These Released Questions Do Not Comprise a "Mini Test"***

To ensure future valid and reliable tests, some content must remain secure for possible use on future exams. As such, this document is *not* intended to be representative of the entire test, to show how operational tests look, or to provide information about how teachers should administer the test; rather, its purpose is to provide an overview of how the test reflects the demands of the New York State P-12 Learning Standards.

The released questions do not represent the full spectrum of the standards assessed on the State tests, nor do they represent the full spectrum of how the standards should be taught and assessed in the classroom. It should not be assumed that a particular standard will be measured by an identical question in future assessments. Specific criteria for writing test questions, as well as additional assessment information, are available at <http://www.engageny.org/common-core-assessments>.

# 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

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## 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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1

A certain human red blood cell has a diameter of 0.000007 meters. Which expression represents this diameter, in meters, in scientific notation?

A  $7 \times 10^{-6}$

B  $7 \times 10^{-5}$

C  $7 \times 10^6$

D  $7 \times 10^5$

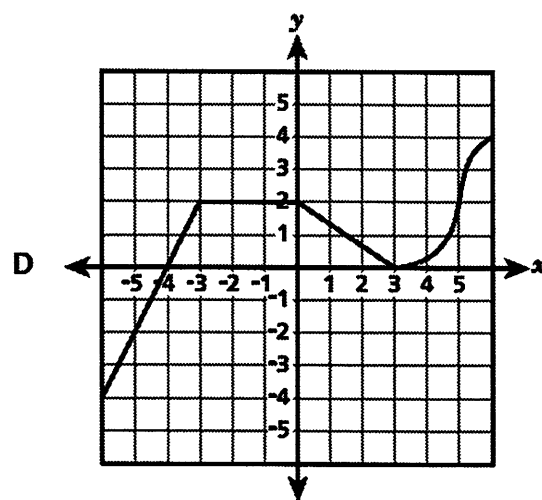
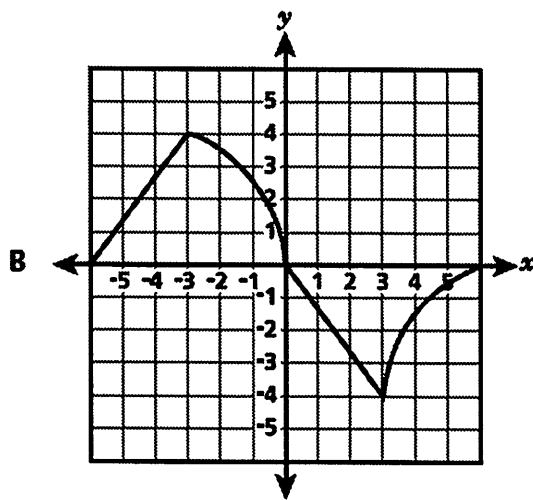
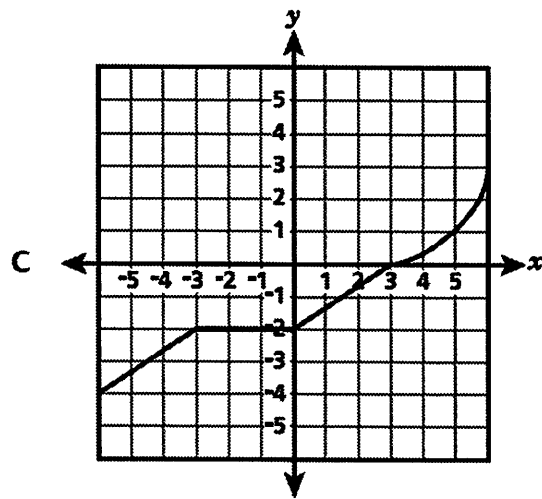
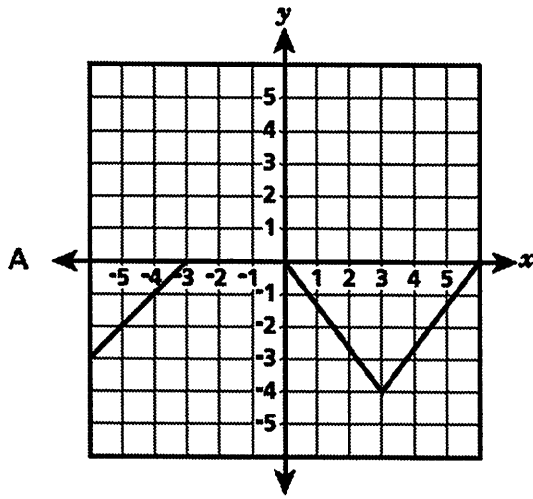
**GO ON**

2

A function has the following properties:

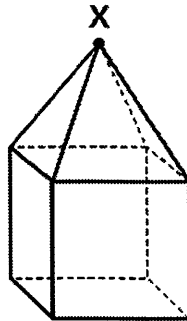
- It is increasing and linear when the value of  $x$  is between  $-5$  and  $-3$ .
- It remains constant when the value of  $x$  is between  $-3$  and  $0$ .
- It is decreasing and linear when the value of  $x$  is between  $0$  and  $3$ .
- It is increasing and nonlinear when the value of  $x$  is between  $3$  and  $5$ .

Which graph best represents this function?



3

The figure shown below consists of a square pyramid on top of a cube. A vertical plane passes through point X and is perpendicular to the bases of both shapes, slicing the figure into equal halves.



What shape is created by the intersection of the vertical plane and these three-dimensional shapes?

- A square
- B triangle
- C hexagon
- D pentagon

**GO ON**

**4**

Ms. Gibson made an initial deposit of \$500 when opening a bank account. After the initial deposit, she deposited the same amount of money each month. The table below shows the total amount of money,  $a$ , she deposited into the account after a certain number of months,  $t$ , since opening it.

	Total Amount Depo i
4	\$1,500
8	\$2,500
10	\$3,000
13	\$3,750

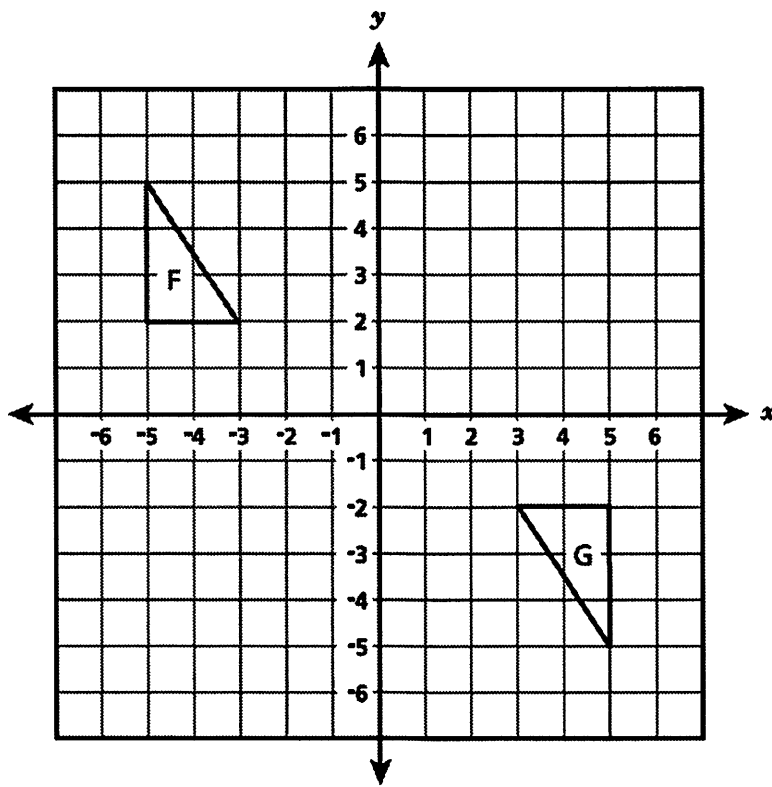
Which equation models the relationship between  $a$  and  $t$ ?

- A  $a = 250t$
- B  $a = 500t$
- C  $a = 250t + 500$
- D  $a = 500t + 250$



5

Triangle F and triangle G are shown below.



Which sequence does not transform triangle F to triangle G?

- A a  $180^\circ$  clockwise rotation about the origin
- B a  $180^\circ$  counterclockwise rotation about the origin
- C a reflection over the  $x$ -axis and then a reflection over the  $y$ -axis
- D a reflection over the  $y$ -axis and then a  $90^\circ$  clockwise rotation about the origin

**GO ON**

6

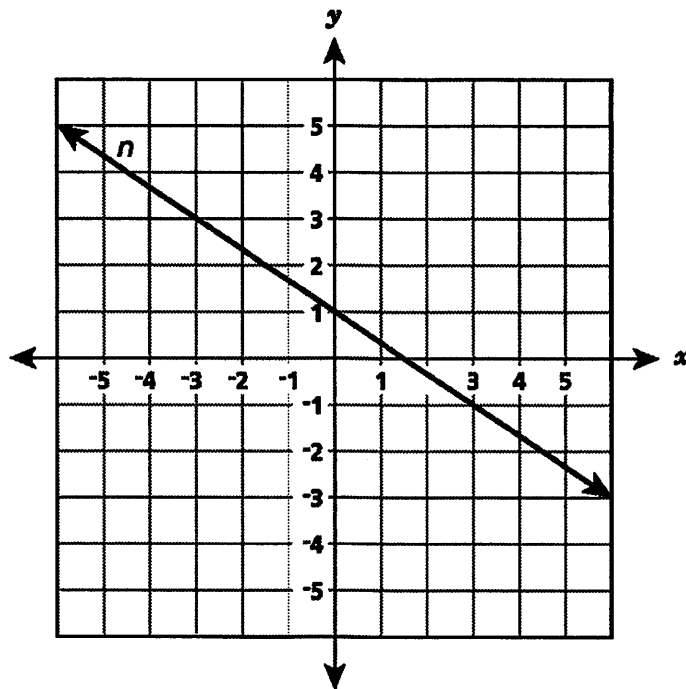
Which statement explains the type of function that is represented by the equation  $y = x^2 + 9$ ?

- A The function is linear because it contains more than one term.
- B The function is linear because the variable  $x$  is raised to the second power.
- C The function is nonlinear because it contains more than one term.
- D The function is nonlinear because the variable  $x$  is raised to the second power.

**GO ON**

7

Line  $n$  is shown on the grid below.



Line  $q$  will be graphed on the same grid. The only solution to the system of linear equations formed by lines  $n$  and  $q$  occurs when  $x = \frac{3}{2}$  and  $y = 0$ . Which equation could represent line  $q$ ?

- A  $y = \frac{3}{2}x$
- B  $y = \frac{4}{3}x - 2$
- C  $y = -\frac{5}{2}x + 1$
- D  $y = -\frac{2}{3}x + \frac{3}{2}$

**GO ON**

**8**

The table represents linear Function F.

$x$	$y$
4	18
6	24
10	36

The equation  $y = 4x + 2$  represents Function G.

Which statement is true?

- A The rate of change of Function G is less than the rate of change of Function F because  $2 < 3$ .
- B The rate of change of Function G is less than the rate of change of Function F because  $4 < 9$ .
- C The rate of change of Function G is greater than the rate of change of Function F because  $2 > \frac{9}{7}$ .
- D The rate of change of Function G is greater than the rate of change of Function F because  $4 > 3$ .

**GO ON**

**9**

What is the solution to the equation shown below?

$$\frac{2}{3}x + 5 = 1$$

- A  $x = -6$
- B  $x = 4$
- C  $x = -4.5$
- D  $x = 9$

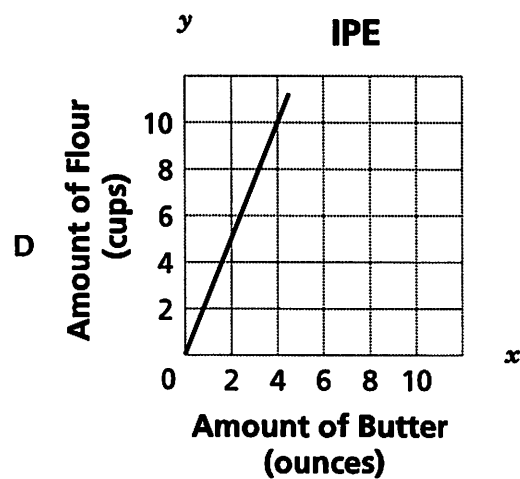
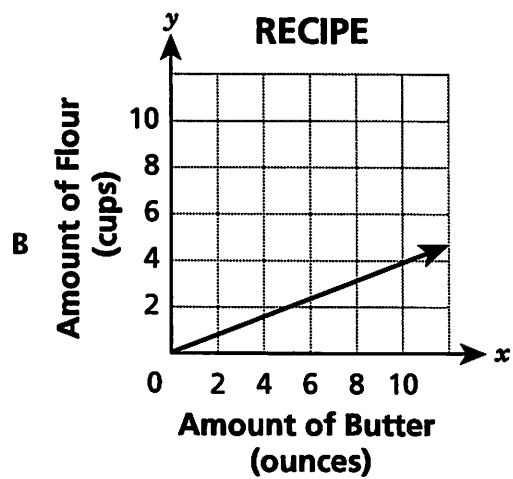
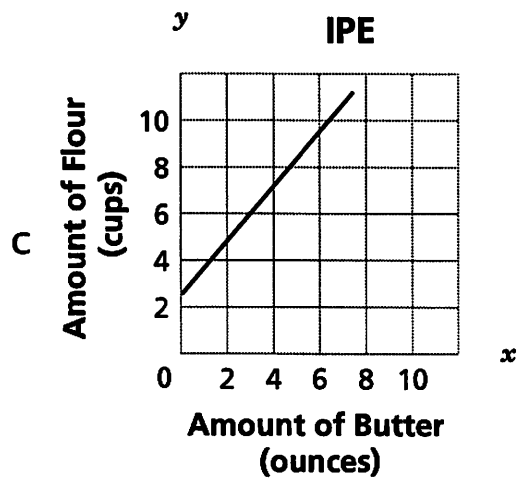
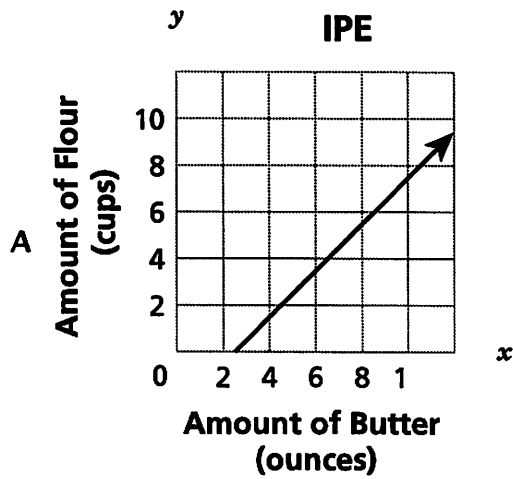
**10**

A company performed power tests on a set of batteries of the same type. The company determined that the equation  $y = 100 - 8.9x$ , where  $x$  is the number of hours of use and  $y$  is the percent of battery power remaining, models the battery life. Based on the equation, what is the **best** prediction of the percent of remaining power for a battery after 11 hours of use?

- A 1.2%
- B 2.1%
- C 10%
- D 97.9%

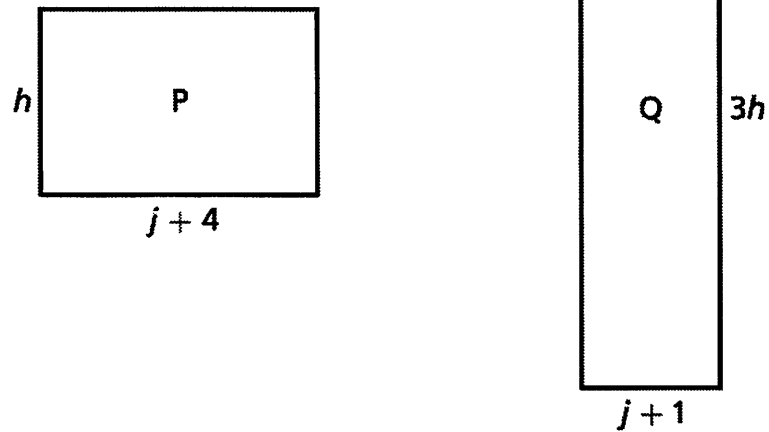
**GO ON**

A cook uses 2.5 cups of flour for each ounce of butter in a recipe. Which graph represents the relationship between the amount of flour and the amount of butter in the recipe?



18

Two rectangles are shown below. Rectangle P has a perimeter of 20 inches. Rectangle Q has a perimeter of 30 inches.



What are the values of  $j$  and  $h$ ?

- A  $j=3$  and  $h=3$
- B  $j=10$  and  $h=4$
- C  $j=2$  and  $h=4$
- D  $j=9.5$  and  $h=6.5$

**GO ON**

A school club had a T-shirt sale to raise money. After the sale, an inventory showed that 108 blue T-shirts and 96 green T-shirts had been sold. The sizes of these T-shirts included 60 small, 86 medium, and 58 large. Which table correctly represents these data?

**NUMBER OF T-SHIRTS SOLD**

A

Color	Small	Medium	Large
Blue	60	86	58
Green	60	86	58

**NUMBER OF T-SHIRTS SOLD**

B

Color	Small	Medium	Large
Blue	34	46	28
Green	26	40	30

**NUMBER OF T-SHIRTS SOLD**

C

Color	Small	Medium	Large
Blue	30	43	29
Green	30	43	29

**NUMBER OF T-SHIRTS SOLD**

D

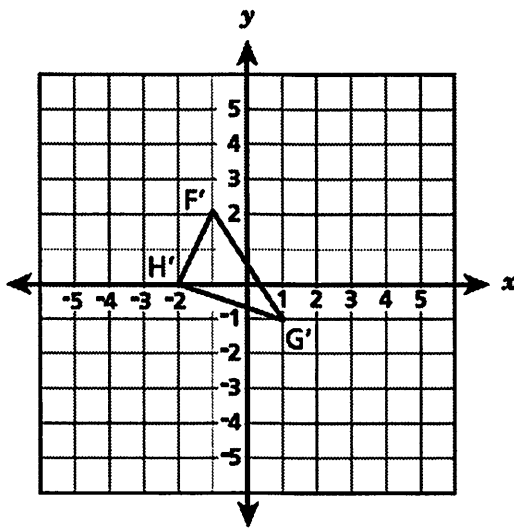
Color	Small	Medium	Large
Blue	26	40	30
Green	34	46	28

**GO ON**



20

The vertices of a triangle are located at  $F(-4, -2)$ ,  $G(2, 2)$ , and  $H(0, -4)$ . A sequence of transformations to triangle  $FGH$  results in triangle  $F'G'H'$ , as shown below.



Which sequence of transformations to triangle  $FGH$  results in triangle  $F'G'H'$ ?

- A a  $90^\circ$  clockwise rotation about the origin, then a dilation by a scale factor of 2 with a center of dilation at the origin
- B a  $90^\circ$  counterclockwise rotation about the origin, then a dilation by a scale factor of 2 with a center of dilation at the origin
- C a  $90^\circ$  counterclockwise rotation about the origin, then a dilation by a scale factor of  $\frac{1}{2}$  with a center of dilation at the origin
- D a  $90^\circ$  clockwise rotation about the origin, then a dilation by a scale factor of  $\frac{1}{2}$  with a center of dilation at the origin

**GO ON**

**24** What is the value of  $n$  in the equation shown below?

$$2^2 \times 2^n = (2^4)^3$$

- A 5
- B 6
- C 10
- D 12

**25** Which set of ordered pairs represents a function?

- A  $\{(2, 7), (2, 8), (3, 8)\}$
- B  $\{(3, 2), (3, 3), (3, 4)\}$
- C  $\{(4, 1), (5, 1), (4, 4)\}$
- D  $\{(5, 6), (8, 6), (9, 6)\}$

**26** A parallelogram with vertices at  $(0, 3)$ ,  $(2, 0)$ ,  $(4, 2)$ , and  $(2, 5)$  is reflected over the  $y$ -axis. Which vertex of the parallelogram will have the same  $x$ -coordinate before and after the reflection?

- A  $(0, 3)$
- B  $(2, 0)$
- C  $(4, 2)$
- D  $(2, 5)$

**STOP**