

NEXT-GENERATION
**Quantitative Reasoning,
Algebra, and Statistics**

Sample Questions

Translate algebraic expressions (237-249 range)

1. Which of the following expressions is 5 times as much as the sum of r and s ?
 - A. $5 \times r + s$
 - B. $5 + r + s$
 - C. $r + s \times 5$
 - D. $(r + s) \times 5$

Solve multi-step equations (250-262 range)

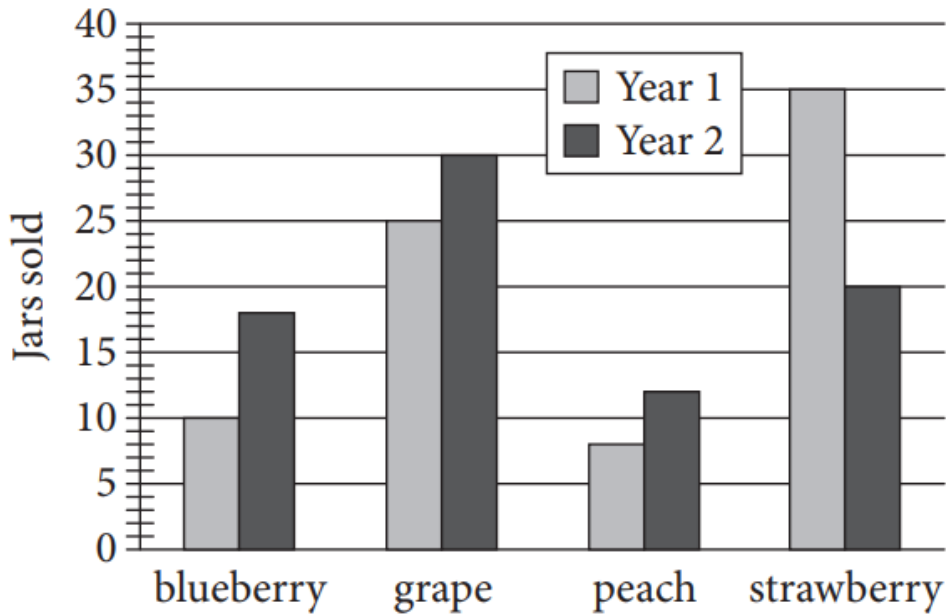
2. What is the solution to the equation $\frac{1}{2}x + \frac{3}{2}(x + 1) - \frac{1}{4} = 5$?
- A. $\frac{5}{2}$
 - B. $\frac{13}{8}$
 - C. $\frac{15}{8}$
 - D. $\frac{17}{8}$

Apply unit conversions (250-262 range)

3. What is the number of grams in 500 kilograms?
(1 kilogram = 1,000 grams)
- A. 0.5
 - B. 5,000
 - C. 50,000
 - D. 500,000

Interpret a graph (250-262 range)

4.



Robert sells four different flavors of jam at an annual farmers market. The graph above shows the number of jars of each type of jam he sold at the market during the first two years. Which flavor of jam had the greatest increase in number of jars sold from Year 1 to Year 2?

- A. Blueberry
- B. Grape
- C. Peach
- D. Strawberry

Write the equation of a line (263-275 range)

5. In the xy -plane, a line crosses the y -axis at the point $(0, 3)$ and passes through the point $(4, 5)$. Which of the following is an equation of the line?

A. $y = \frac{1}{2}x + 3$

B. $y = 2x + 3$

C. $y = \frac{1}{2}x - 4$

D. $y = 2x - 4$

YoYo

In the x - y plane, find the equation of the line that goes through the points $(2, 5)$ and $(4, 9)$.

Interpret the y-intercept (263-275 range)

6. The amount of money M , in dollars, Paul earns can be represented by the equation $M = 12.5h + 11$, where h is the number of hours Paul works. Which of the following is the best interpretation of the number 11 in the equation?
- A. The amount of money, in dollars, Paul earns each hour
 - B. The total amount of money, in dollars, Paul earns after working for h hours
 - C. The total amount of money, in dollars, Paul earns after working for one hour
 - D. The amount of money, in dollars, Paul earns in addition to an hourly wage

Find the mean of a single data set (263-275 range)

7.

| Country | Approximate population (millions) |
|----------------|-----------------------------------|
| France | 65.9 |
| Germany | 80.8 |
| Italy | 60.8 |
| Spain | 46.5 |
| United Kingdom | 64.3 |

The table gives the population of the 5 largest countries in the European Union in the year 2014. Which of the following is closest to the mean population of these countries?

- A. 80.8 million
- B. 64.3 million
- C. 63.7 million
- D. 60.8 million

Operate with integers (236 and below range)

8. Which of the following fractions is equivalent

to $\frac{-6 - (-9)}{8}$?

A. $-\frac{3}{8}$

B. $\frac{3}{8}$

C. $-\frac{15}{8}$

D. $\frac{15}{8}$

Solve a single-step rate problem (237-249 range)

9. Water runs from a pump at a rate of 1.5 gallons per minute. At this rate, how long would it take to fill a tub with a 150-gallon capacity?
- A. 10 minutes
 - B. 100 minutes
 - C. 225 minutes
 - D. 2,250 minutes

Solve area and volume problems (250-262 range)

10. The volume of a right rectangular prism is found by multiplying the length of the base by the width of the base by the height of the prism. A right rectangular prism has a volume of 30 cubic inches. If the height of the prism is 6 inches, what is the area of the base of the prism?
- A. 5 square inches
 - B. 24 square inches
 - C. 36 square inches
 - D. 180 square inches

YoYo

State whether the following is true or false:

$$\frac{6+9}{2+3} = \frac{6}{2} + \frac{9}{3} = 3+3 = 6$$

Solve multi-step ratios (250-262 range)

11. Jacoby followed a recipe that requires 2 cups of water for every 3 cups of flour. If he used 8 cups of flour, how many cups of water did he use?
- A. $2\frac{2}{3}$
 - B. 4
 - C. $5\frac{1}{3}$
 - D. 12

Simplify expressions (250-262 range)

12. $4(x + 5) + 4x + 8$

Which of the following is equivalent to the expression above?

- A. $4(2x + 7)$
- B. $8(x + 4)$
- C. $5x + 17$
- D. $8x + 13$

Solve rate problem (250-262 range)

13. It took Khalid 90 minutes to complete 40 tasks. Which of the following is an equivalent rate?
- A. 10 tasks in 0.9 minutes
 - B. 10 tasks in 2.25 minutes
 - C. 10 tasks in 9 minutes
 - D. 10 tasks in 22.5 minutes

Calculate conditional probability (263-275 range)

14.

| | Plans to vote “yes” on issue Q | Plans to vote “no” on issue Q | Total |
|-----------------------------------|-----------------------------------|----------------------------------|-------|
| Plans to vote “yes” on issue P | 8 | 12 | 20 |
| Plans to vote “no” on issue P | 14 | 16 | 30 |
| Total | 22 | 28 | 50 |

The table above shows a survey of 50 registered voters in a city. Each voter was asked whether they planned to vote “yes” or “no” on two different issues. If a voter who plans to vote “yes” on issue P is randomly selected, what is the probability that voter also plans to vote “yes” on issue Q?

- A. 0.16
- B. 0.36
- C. 0.40
- D. 0.67

Evaluate with negative exponents (263-275 range)

15. Which of the following values is equivalent to 5^{-3} ?

- A. $\frac{1}{15}$
- B. $\frac{1}{125}$
- C. -15
- D. -125

YoYo

Simplify the following:

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

Simplify expressions with exponents (250-262 range)

16. Which of the following expressions is equivalent to $(x^3 \cdot x^2)^5$?
- A. x^{10}
 - B. x^{15}
 - C. x^{25}
 - D. x^{30}

Solve multi-step unit conversion (250-262 range)

17. The elevation at the summit of Mount Whitney is 4,418 meters above sea level. Climbers begin at a trailhead that has an elevation of 2,550 meters above sea level. What is the change in elevation, to the nearest foot, between the trailhead and the summit? (1 foot = 0.3048 meters)
- A. 569 feet
 - B. 5,604 feet
 - C. 6,129 feet
 - D. 14,495 feet

Solve a system of equations (263-275 range)

18. $3x - 2y = 15$
 $x = 3$

The two lines given by the equations above intersect in the xy -plane. What is the value of the y -coordinate of the point of intersection?

- A. -7
- B. -3
- C. 3
- D. 7

Find unions/intersections of sets (276+ range)

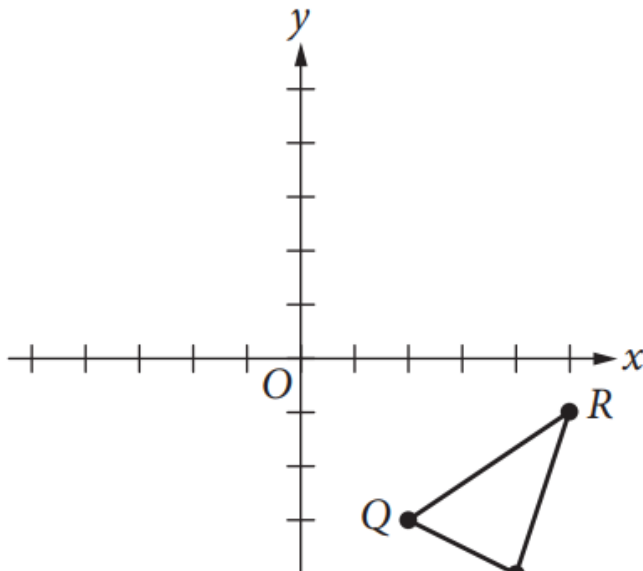
19. $L = \{0, 20, 40, 80, 100\}$
 $M = \{5, 10, 15, 20, 25\}$
 $N = \{10, 20, 30, 40, 50\}$

Sets L , M , and N are shown above. Which of the following sets represents $L \cup (M \cap N)$ (the union of L with the intersection of sets M and N)?

- A. $\{0, 5, 10, 15, 20, 25, 30, 40, 50, 80, 100\}$
- B. $\{0, 10, 20, 40, 80, 100\}$
- C. $\{20, 40\}$
- D. $\{20\}$

Conduct transformations in the plane (276+ range)

20.



Triangle PQR lies in the xy -plane, and the coordinates of vertex Q are $(2, -3)$. Triangle PQR is rotated 180° clockwise about the origin and then reflected across the y -axis to produce triangle $P'Q'R'$, where vertex Q' corresponds to vertex Q of triangle PQR . What are the coordinates of Q' ?

- A. $(-3, -2)$
- B. $(3, -2)$
- C. $(-2, 3)$
- D. $(2, 3)$