

Entry-Level Assessment

Multiple Choice

Read each question. Then write the letter of the correct answer on your paper.

1. Let $A = \{1, 2, 3, 4\}$ be a set in the universe $U = \{1, 2, 3, 4, 5, 6, 7, 8\}$. What is the complement of A ?

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

2. Solve $x^2 + 2x - 3 = 0$ by factoring.

(F) $x = -3$ and $x = 1$
(G) $x = -1$ and $x = 3$
(H) $x = 0$
(I) $x = -3$ and $x = 0$

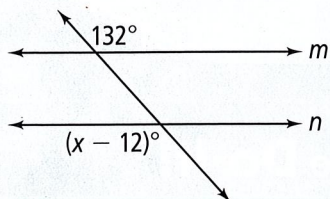
3. Simplify $\frac{3a^2b^3 - 12a^4b^3 + 6a^4b^2}{3a^2b}$.

(A) $b^2 - 4a^2b^2 + 2a^2b$
(B) $a^2b - 4a^2b^2 + 2a^2b$
(C) $3b^2 - 12a^2b + 6b^2$
(D) $3ab^2 - 4a^2b + 2ab^2$

4. Which relation is not a function?

(F) $\{(1, -5), (2, 4), (1, -4)\}$
(G) $\{(1, -5), (2, 4), (3, -3)\}$
(H) $\{(1, -5), (2, 4), (3, 2)\}$
(I) $\{(1, -5), (2, 4), (3, -4)\}$

5. In the diagram, m and n are parallel.



What is the value of x ?

(A) 36 (C) 120
(B) 60 (D) 144

6. Solve $2(1 - 2w) = 4w + 18$.

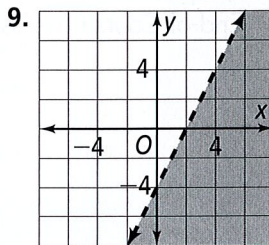
(F) -4 (H) 8
(G) -2 (I) 16

7. Which of the following lines is perpendicular to the line $3x + y = 2$?

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

8. If $y = 1$, then $(x + 5) \cdot y = x + 5$. Which property supports this statement?

(F) Inverse Property of Multiplication
(G) Identity Property of Multiplication
(H) Associative Property of Addition
(I) Commutative Property of Addition



Which inequality does the graph represent?

(A) $y < 2x - 4$
(B) $y > -4x + 2$
(C) $y > 2x - 4$
(D) $y < -4x + 2$

10. The area of a trapezoid is $A = \frac{1}{2}h(b_1 + b_2)$. Solve for b_1 .

(F) $b_1 = \frac{2A - b_2}{h}$
(G) $b_1 = \frac{2A - h}{b_2}$
(H) $b_1 = \frac{2A}{h} - b_2$
(I) $b_1 = 2A - b_2$

11. Let \overrightarrow{AB} be parallel to \overrightarrow{CD} , with $A(-2, 3)$, $B(1, 4)$, and $C(1, 2)$. Which of the following could be the coordinates of point D ?

(A) (4, 1) (C) (-2, 3)
(B) (-2, -1) (D) (4, 3)

12. Solve $3 \geq 4g - 5 \geq -1$.

(F) $-\frac{3}{2} \leq g \leq 2$ (H) $-4 \leq g \leq 8$
(G) $-1 \leq g \leq \frac{3}{4}$ (I) $1 \leq g \leq 2$

13. Which is *not* a solution of $5(2x + 4) \geq 2(x + 34)$?

(A) 48 (C) 6
(B) 8 (D) 3

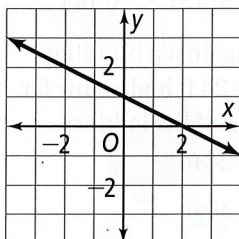
14. Factor $6x^2 - 216$.

(F) $6(x - 6)(x + 6)$
(G) $(6x - 36)(6x + 36)$
(H) $6(x - 6)$
(I) $6(x - 36)(x + 6)$

15. Mike and Jane leave their home on bikes traveling in opposite directions on a straight road. Mike rides 5 mi/h faster than Jane. After 4 h they are 124 mi apart. At what rate does Mike ride his bike?

(A) 5 mi/h (C) 18 mi/h
(B) 13 mi/h (D) 31 mi/h

16. What is the point-slope form for the equation of the line in the graph?



(F) $y - 2 = \frac{3}{2}(x + 2)$
(G) $y - 2 = \frac{1}{2}(x + 2)$
(H) $y - 2 = -\frac{1}{2}(x + 2)$
(I) $y - 2 = -\frac{2}{3}(x + 2)$

17. A rectangular photograph is being enlarged to poster size by making both the length and width six times as large as the original. How many times as large as the area of the original photograph is the area of the poster?

(A) $\frac{1}{6}$ (C) 12
(B) 6 (D) 36

18. A rectangle has a length of $2x + 3$ and a width of $x - 4$. Find the area of the rectangle.

(F) $2x^2 - 12$
(G) $2x^2 - 8x$
(H) $2x^2 - 5x - 12$
(I) $2x^2 - 11x - 12$

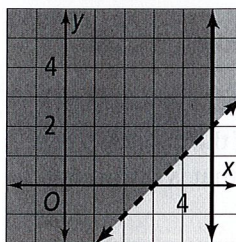
19. What is the y-intercept of the line that passes through the points $(-4, 4)$ and $(2, -5)$?

(A) -2 (C) $\frac{3}{2}$
(B) $-\frac{3}{2}$ (D) 2

20. Which of the following is equivalent to $\sqrt{2}(\sqrt{6} - 4)$?

(F) $\sqrt{12} - 4$ (H) $\sqrt{12} - 8$
(G) $2\sqrt{3} - 2\sqrt{2}$ (I) $2\sqrt{3} - 4\sqrt{2}$

21. Which of the following represents the system shown in the graph?



(A) $\begin{cases} y = x - 3 \\ x \geq 5 \end{cases}$ (C) $\begin{cases} y < x - 3 \\ x = 5 \end{cases}$
(B) $\begin{cases} y \leq x - 3 \\ x > 5 \end{cases}$ (D) $\begin{cases} y > x - 3 \\ x \leq 5 \end{cases}$

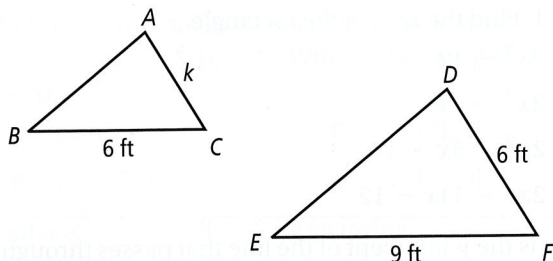
22. Which of the following equations represents the line that is parallel to the line $y = 5x + 2$ and that passes through the point $(1, -3)$?

(F) $y = -5x + 2$ (H) $y = \frac{1}{5}x - 8$
(G) $y = 5x + 8$ (I) $y = 5x - 8$

23. Which equation represents a line that would be perpendicular to a second line with a slope of $\frac{1}{5}$?

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

24. $\triangle ABC$ is similar to $\triangle DEF$.



What is the value of k ?

- (F) 3 ft
 (G) 4 ft
 (H) 6 ft
 (I) 9 ft

25. Solve the equation using the Quadratic Formula.

$$6x^2 - 10x + 3 = 0$$

- (A) $\frac{5 \pm \sqrt{7}}{6}$
 (B) $\frac{3 \pm \sqrt{5}}{6}$
 (C) -2 and 5
 (D) $\frac{3}{4}$ and $\frac{2}{3}$

26. A rectangle in the coordinate plane has vertices (3, 2), (8, 2), (3, 6), and (8, 6). Which of the following sets of vertices describes a rectangle that is congruent to this one?

- (F) (3, -2), (3, -8), (5, -8), (5, -2)
 (G) (-2, -4), (-2, -8), (3, -8), (3, -4)
 (H) (0, 0), (5, 0), (5, 5), (0, 5)
 (I) (-3, 2), (1, 2), (1, 6), (-3, 6)

27. Simplify the expression below.

$$(-6y^{-4})^5$$

- (A) $7776y^{20}$
 (B) $\frac{7776}{y^{20}}$
 (C) $-7776y^{20}$
 (D) $-\frac{7776}{y^{20}}$

28. What is the solution to $\frac{2n + 8}{3} = \frac{n + 7}{2}$?

- (F) -9
 (G) -1
 (H) 5
 (I) 13

29. Solve the system of equations below.

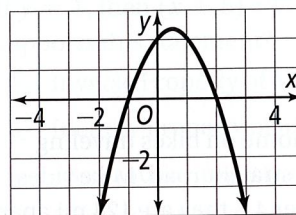
$$\begin{cases} 3x + y = -7 \\ 4x - y = -14 \end{cases}$$

- (A) (-3, 2)
 (B) (3, 2)
 (C) (-3, -2)
 (D) no solution

30. Which of the following is equivalent to $\frac{2x - 12}{x^2 - 2x - 24}$?

- (F) $\frac{2}{x + 4}$
 (G) $\frac{1}{x + 2}$
 (H) $\frac{1}{x^2 - 2}$
 (I) $\frac{2x - 3}{x - 6}$

31. What is (are) the solution(s) of the graphed function when the value of the function is 0?



- (A) -1 and 2
 (B) 1 and -2
 (C) 2
 (D) 2.2

32. Which of the following is true?

- (F) $\sqrt{85} < 9$
 (G) $8 < \sqrt{62}$
 (H) $\sqrt{\frac{16}{25}} > \sqrt{\frac{16}{4}}$
 (I) $\sqrt{121} < \sqrt{144}$

33. A firefighter leans a 30-ft ladder against a building in order to reach a window that is 24 ft high. How far away from the building is the base of the ladder?

- (A) 18 ft
 (B) 20 ft
 (C) 24 ft
 (D) 30 ft

34. What is the number of x -intercepts of the parabola with equation $y = 6x^2 - 4x - 3$?

- (F) 0
 (G) 1
 (H) 2
 (I) 3