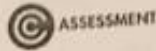


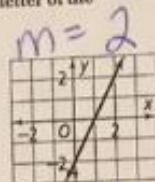
Common Core End-of-Course Assessment



Selected Response

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

1. Which equation represents a line with a greater slope and lesser y-intercept than the line shown?



- (A) $y = x - 1$
 (B) $y = -x - 1$
 (C) $y = -2x - 2$
 (D) $y = 3x - 3$

2. Which expression is equivalent to

- (A) $3(x^2 + 1) - 5x(x^2 + x + 1)$
 (B) $-5x^3 + 8x^2 + 5x + 3$
 (C) $-5x^3 - 2x^2 - 5x + 3$
 (D) $-10x^3 + x^2 - 7x + 6$
 (E) $5x^3 - 2x^2 - 5x + 3$

Distribute
 $3x^2 + 3 - 5x^3 - 5x^2 - 5x$
 $-5x^3 - 2x^2 - 5x + 3$

3. You roll a pair of number cubes. What is the probability of rolling odd numbers on both cubes?

- (A) $\frac{1}{12}$
 (B) $\frac{1}{6}$
 (C) $\frac{1}{4}$
 (D) $\frac{2}{3}$

3	X	3	X	3	X
11	21	31	41	51	61
13	22	32	42	52	62
14	23	33	43	53	63
15	24	34	44	54	64
16	25	35	45	55	65
	26	36	46	56	66

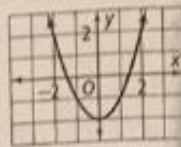
$\frac{9}{36}$

4. What is the greatest value in the range of $f(x) = x^2 - 3$ for the domain $\{-3, 0, 1, 2\}$?

- (A) -3
 (B) 0
 (C) 2
 (D) 6

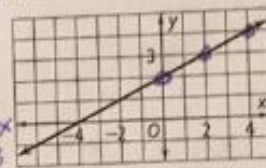
$f(-3) = (-3)^2 - 3 = 9 - 3 = 6$
 $f(0) = 0^2 - 3 = 0 - 3 = -3$
 $f(1) = 1^2 - 3 = 1 - 3 = -2$
 $f(2) = 2^2 - 3 = 4 - 3 = 1$

5. Which equation best represents the graph at the right?



- (A) $y = x^2$
 (B) $y = -x^2$
 (C) $y = x^2 - 2$
 (D) $y = x^2 + 2$

6. Which table models the graph shown below?



(A)

x	-2	0	1	4
y	1	2	3	4

(B)

x	-6	-3	0	6
y	-1	0.5	2	5

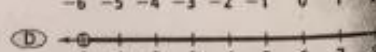
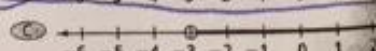
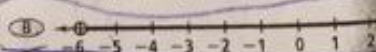
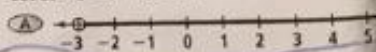
(C)

x	-1	0	3	4
y	-6	-4	2	4

(D)

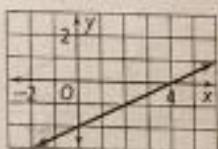
x	0	0.5	1	2
y	-4	-3	-2	0

7. Which of the graphs below represents the solution set of $-3 < x + 3 \leq 7$?



$-3 < x + 3 \leq 7$
 $-3 - 3 - 3$
 $-6 < x \leq 4$
 Open circle at -6, closed circle at 4

11. Consider the graph shown below. Which statement is always a correct conclusion about the coordinates of the points on the graph?



$(0, -2)$
 $(2, -1)$
 $(4, 0)$
 $x > y$

- (F) The x -values are always 2 less than the y -values. **X**
 (G) The y -values are always 4 more than the x -values. **X**
 (H) For positive values of x , the x -values are always greater than the y -values. **C**
 (I) For positive values of x , the y -values are always greater than the x -values.

12. Which expression is equivalent to $\frac{4x^2 - 9}{6x^2 + 9x}$?

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

$\frac{4x^2 - 9}{6x^2 + 9x} = \frac{(2x+3)(2x-3)}{3x(2x+3)}$
 Factor & Cancel $\frac{2x-3}{3x}$

13. Which ordered pair is a solution of the given system?

- $2x + 5y = -11$
 $10x + 3y = 11$
 (F) $(3, -2)$
 (G) $(-3, 2)$

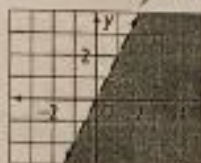
$-10x - 25y = 55$
 $10x + 3y = 11$
 $-22y = 66$
 $y = -3$
 $2x + 5(-3) = -11$
 $2x - 15 = -11$
 $2x = 4$
 $x = 2$
 $(2, -3)$

14. What is the slope-intercept form of the equation $-3x + 4y = 8$?

- (A) $y = 3x + 2$
 (B) $y = -3x + 8$
 (C) $y = \frac{3}{4}x + 2$
 (D) $y = -\frac{3}{4}x + 2$

$-3x + 4y = 8$
 $+3x \quad +3x$
 $4y = 3x + 8$
 $\frac{4y}{4} = \frac{3x}{4} + \frac{8}{4}$
 $y = \frac{3}{4}x + 2$

12. What is a linear inequality that describes the graph below?



$m = 2$
 $y\text{-int} = 0$
 $y = 2x$
 $y < 2x$

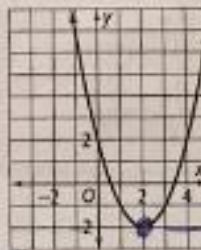
- (F) $y \leq 2x$
 (G) $y < 2x$
 (H) $y > 2x$
 (I) $y \geq 2x$

13. What equation do you get when you solve $2x^2y - 4y = -24$ for y ?

- (A) $y = \frac{-12}{x^2 - 2}$
 (B) $y = \frac{12}{x^2 + 2}$
 (C) $y = \frac{12}{x^2 - 2}$
 (D) $y = -x^2 - 22$

$2x^2y - 4y = -24$
 $(2x^2 - 4)y = -24$
 $y = \frac{-24}{2x^2 - 4} = \frac{-24 \cdot 2}{2(x^2 - 2)} = \frac{-48}{2(x^2 - 2)} = \frac{-24}{x^2 - 2}$

14. What is the minimum point of the parabola graphed below?

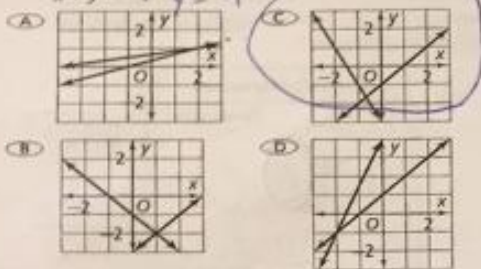


- (F) $(-2, 2)$
 (G) $(2, -2)$
 (H) $(0, 2)$
 (I) There is no minimum.

15. What is the graph of the given system of equations?

$$2x + y = -3 \quad y = -3$$

$$-x + y = -1 \quad y = -1$$

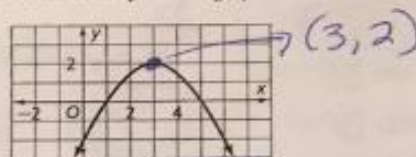


16. What is $\sqrt{81n^3}$ in exponential form?

(A) $9n!$
 (B) $9n!$
 (C) $9n^{\frac{3}{2}}$
 (D) $81n!$

$\sqrt{81n^3} = 9\sqrt{n^3}$
 $9n^{\frac{3}{2}}$

17. What is the vertex of the parabola graphed below?



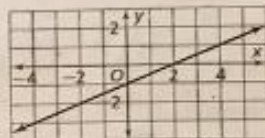
- (A) (0, -1)
 (B) (1, 0)
 (C) (3, 2)
 (D) (5, 0)

18. A line passes through the point $(-3, -2)$ and has slope 2. What is an equation of the line?

(A) $y = 2x - 0.5$
 (B) $y = 2x + 0.5$
 (C) $y = 2x + 1$
 (D) $y = 2x + 4$

$y - y_1 = m(x - x_1)$
 $y - (-2) = 2(x - (-3))$
 $y + 2 = 2(x + 3)$
 $y + 2 = 2x + 6$
 $y = 2x + 4$

19. What equation describes a line that is parallel to the line below and passes through the point $(-2, 1)$?



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

$m = \frac{1}{2}$
 parallel slope: $\frac{1}{2}$
 $y - y_1 = m(x - x_1)$
 $y - 1 = \frac{1}{2}(x + 2)$
 $y - 1 = \frac{1}{2}x + 1 + 1$

20. What is an equation of the axis of symmetry for the graph of the function $f(x) = 2x^2 + 4x - 5$?

(A) $x = -1$
 (B) $x = 1$
 (C) $x = -2$
 (D) $x = 2$

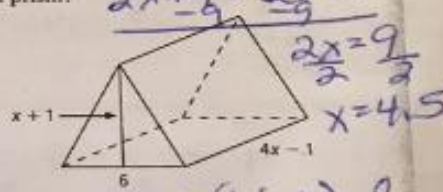
$x = -\frac{b}{2a}$
 $x = \frac{-4}{2 \cdot 2} = \frac{-4}{4} = -1$

21. What is the solution of the equation $3 \cdot \frac{4x+3}{3} - \frac{2x-1}{2} = 3$?

(A) 0
 (B) 4.5
 (C) 7
 (D) 8

$2(4x+3) - \frac{(2x-1) \cdot 3}{2} = 3 \cdot 2 = 6$
 $8x + 6 - \frac{6x - 3}{2} = 6$
 $8x + 6 - 3x + 1.5 = 6$
 $5x + 7.5 = 6$
 $5x = -1.5$
 $x = -0.3$

22. Which polynomial represents the volume of the triangular prism?



(A) $24x^2 + 18x - 6$
 (B) $12x^2 + 9x - 3$
 (C) $4x^2 + 5x - 1$
 (D) $4x^2 + 3x - 1$

$V = (\frac{1}{2}b \cdot h) \cdot l$
 $V = \frac{1}{2} \cdot 6(x+1)(4x-1)$
 $V = 3(x+1)(4x-1)$
 $V = (3x+3)(4x-1)$
 $V = 12x^2 - 3x + 12x - 3$
 $V = 12x^2 + 9x - 3$

$$(x - \frac{1}{3})(x + \frac{12}{3}) = \frac{4}{3}$$

$$(3x - 1)(x + 4) = 0$$

$$3x - 1 = 0 \rightarrow x = \frac{1}{3}$$

$$x + 4 = 0 \rightarrow x = -4$$

2. What are the solutions of the equation $3x^2 + 11x - 4 = 0$?
- (A) $\frac{1}{3}, 4$
 (B) $\frac{1}{3}, -4$
 (C) $-\frac{1}{3}, 4$
 (D) $3, -4$

$$3x^2 + 11x - 4 = 0$$

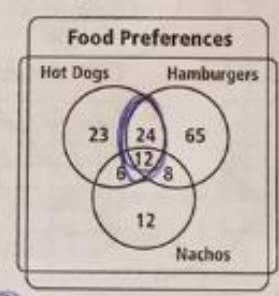
$$x^2 + 11x - 12 = 0$$

$$(x - 1)(x + 12) = 0$$

$$x - 1 = 0 \rightarrow x = 1$$

$$x + 12 = 0 \rightarrow x = -12$$

29. Keysha randomly surveyed 150 people at a football game last weekend to find out whether they like hot dogs, hamburgers, or nachos. She recorded her results in the Venn diagram below. Of the 850 people at the game, how many should she expect to like both hot dogs and hamburgers?



$$150 = \frac{x}{850}$$

$$150x = 850(36)$$

$$\frac{150x}{150} = \frac{850(36)}{150}$$

$$x = \frac{17}{3} \cdot 36 = 204$$

2. What are the solutions of $x^2 + 2 = \sqrt{2x^2 - x - 2}$?
- (F) 6, 1
 (G) -6, -1
 (H) 6, -1
 (I) -6, 1

$$(x + 2)^2 = (\sqrt{2x^2 - x - 2})^2$$

$$x^2 + 4x + 4 = 2x^2 - x - 2$$

$$-x^2 - 4x - 4 = -x^2 - 4x - 4$$

$$0 = x^2 - 5x - 6$$

$$0 = (x - 6)(x + 1)$$

$$x - 6 = 0 \rightarrow x = 6$$

$$x + 1 = 0 \rightarrow x = -1$$

30. What is the simplified form of $\frac{5x^2y^3}{3x^3y^4}$?
- (F) $\frac{5x^2y^7}{3}$
 (G) $\frac{5}{3xy}$
 (H) $\frac{5x^2y^3}{3x^3y^4}$
 (I) $\frac{5y^7}{3x^3}$

$$\frac{5}{3xy}$$

2. Simplify the expression $\frac{27a^3b^4}{9a^2b}$.
- (A) $3ab$
 (B) $18a^4b^3$
 (C) $3a^2b^3$
 (D) $27a^4b^3$

$$\frac{27a^3b^4}{9a^2b} = 3a^{3-2}b^{4-1} = 3a^1b^3 = 3ab^3$$

2. How does the mean of the data set below change if each value is increased by 8?
- 105 110 104 107 102 106 133 81
- (F) The mean increases by 1.
 (G) The mean increases by 8.
 (H) The mean decreases by 8.
 (I) The mean does not change.

$$\frac{848}{8} = 106$$

$$105 + 8 = 113$$

$$110 + 8 = 118$$

$$104 + 8 = 112$$

$$107 + 8 = 115$$

$$102 + 8 = 110$$

$$106 + 8 = 114$$

$$133 + 8 = 141$$

$$81 + 8 = 89$$

$$\frac{912}{8} = 114$$

31. Line p passes through points $(5, -4)$ and $(2, 7)$. What is the slope of a line that is perpendicular to line p ?
- (A) $-\frac{11}{3}$
 (B) $-\frac{3}{11}$
 (C) $\frac{3}{11}$
 (D) $\frac{11}{3}$

$$m = \frac{7 - (-4)}{2 - 5} = \frac{11}{-3}$$

$$m_{\perp} = +\frac{3}{11}$$

2. What is $(2x^2 - 4x + 8) - (3x^2 + 10x + 2)$?
- (A) $-x^2 - 14x - 6$
 (B) $-x^2 + 6x + 6$
 (C) $-x^2 - 14x + 6$
 (D) $5x^2 + 6x + 10$

$$2x^2 - 4x + 8 - 3x^2 - 10x - 2$$

$$-x^2 - 14x + 6$$

2. Which of the following is the solution set for the equation $|p - 2| = 7$?
- (F) $\{-5, 9\}$
 (G) $\{-9, 9\}$
 (H) $\{-5\}$
 (I) $\{9\}$

$$p - 2 = 7 \rightarrow p = 9$$

$$p - 2 = -7 \rightarrow p = -5$$

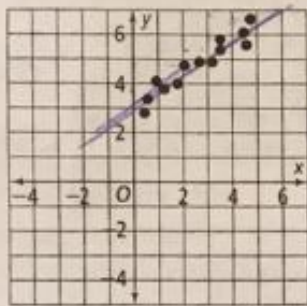
32. Which trend I

- (F)
 (G)
 (H)
 (I)

33. The of th of th
 (A)
 (B)
 (C)
 (D)

34. Whi rep
 (F)
 (G)
 (H)
 (I)
 fu

32. Which of the following is an equation of a reasonable trend line for the scatter plot shown?

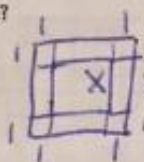


$m = \frac{2}{3}$
 $y\text{-int} \approx 3$

- (F) $y = \frac{1}{3}x + 8$ ~~X~~
 (G) $y = \frac{2}{3}x + 3$
 (H) $y = \frac{1}{2}x - 3$ ~~X~~
 (I) $y = 3x + 3$

33. The sides of a square are all increased by 2 in. The area of the new square is 49 in.^2 . What is the length of a side of the original square?

- (A) 2 in.
 (B) 4.5 in.
 (C) 5 in.
 (D) 9 in.



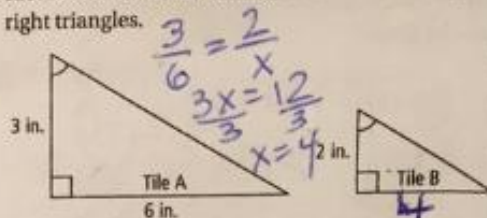
$(x+2)^2 = 49$
 $\sqrt{(x+2)^2} = \sqrt{49}$
 $x+2 = 7$
 $x = 5$

34. Which of the following sets of points does NOT represent a function?

- (F) $\{(-2, 0), (-1, 1), (0, 4), (1, -2), (2, -6)\}$
 (G) $\{(-5, 0), (-4, 0), (-3, 0), (-2, 0), (-1, 0)\}$
 (H) $\{(0, 1), (1, 10), (1, 100), (10, 100), (100, 1000)\}$
 (I) $\{(2, 4), (3, 9), (4, 16), (5, 25), (6, 36)\}$

function: each input has exactly one output

35. Ricardo's art class is making a tile mosaic using similar right triangles.

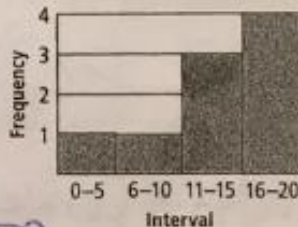


Tile A and Tile B are similar. What is the area of Tile B?

- (A) 4 in.^2
 (B) 5 in.^2
 (C) 6 in.^2
 (D) 12 in.^2

$\frac{1}{2} \cdot 2 \cdot 4 = 4$

36. What type of histogram is shown below?



- (F) skewed
 (G) uniform
 (H) symmetric
 (I) none of these

37. How much shorter would it be to travel from point A to point B diagonally than to travel from point A through point C and up to point B along the perimeter of the rectangle?

- (A) 1268 ft
 (B) 1446 ft
 (C) 2044 ft
 (D) 2543 ft



3. What is the solution of $3x + 7 = 25$?

- (F) $x = 11$
- (G) $x = 8$
- (H) $x = 7$
- (I) $x = 6$

$$\begin{array}{r} -7 \quad -7 \\ \hline 3x = 18 \\ \hline x = 6 \end{array}$$

3. The volume of a cylinder is given by the formula $V = \pi r^2 h$, where V represents the volume, r represents the radius of the base, and h represents the height of the cylinder. Which equation can be used to find r in terms of V and h ?

- (A) $r = \sqrt{\frac{V}{\pi h}}$
- (B) $r = \frac{V}{\pi h}$
- (C) $r = \sqrt{V\pi h}$
- (D) $r = \sqrt{\frac{\pi h}{V}}$

$$\begin{array}{l} V = \pi r^2 h \\ \pi h \quad \pi h \\ \hline \sqrt{\frac{V}{\pi h}} = r \end{array}$$

4. Which of the following functions can be used to find the n th term of the sequence 6, 11, 16, 21, 26, ...?

- (F) $A(n) = 5 + (n - 1)(6)$
- (G) $A(n) = 6 + (n + 1)(5)$
- (H) $A(n) = 6 + (n - 1)(5)$
- (I) $A(n) = 5 + (n + 1)(6)$

$$\begin{array}{c} \vee \vee \vee \\ +5, +5, +5 \end{array}$$

4. Which of the following is equivalent to $\sqrt[3]{64a^2b^3}$?

- (A) $4a^3b^3$
- (B) $64a^2b^3$
- (C) $4a^2b$
- (D) $64a^2b$

$$\sqrt[3]{64a^2b^3} = 2 \cdot 2 \sqrt[3]{a^2b^3}$$

4. What is a solution to the system?

$$\begin{array}{l} y = x^2 + 2x - 15 \\ y - 4x = -12 \end{array}$$

- (F) (0, 3)
- (G) (3, 0)
- (H) (4, 5)
- (I) (-5, 3)

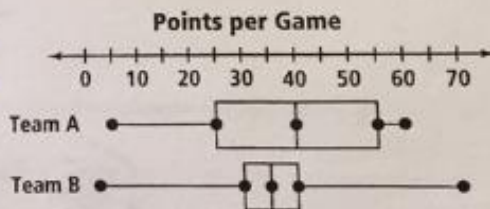
$$\begin{array}{l} y = x^2 + 2x - 15 \\ y - 4x = -12 \\ \hline -y = -x^2 - 2x + 15 \\ \hline 0 = x^2 - 2x - 3 \\ 0 = (x - 3)(x + 1) \\ x - 3 = 0 \quad x + 1 = 0 \\ +3 \quad +3 \quad \quad \quad -1 \quad -1 \\ \hline x = 3 \quad \quad \quad x = -1 \\ (3, 0) \end{array}$$

Constructed Response

- 43. What is the y -coordinate of the vertex of the function $y = 2x^2 + 5x - 8$?
- 44. Lisa is driving a car at an average speed of 55 mi/h.
 - a. What is Lisa's average speed in feet per second?
 - b. How many feet will Lisa travel in 40 min?
- 45. The width of a rectangle is 10 in. less than its length. If the perimeter of the rectangle is 36 in., what is its width in inches?
- 46. Is the question "Do you prefer delicious steak or ordinary meatloaf for dinner?" biased? Explain.
- 47. A new toy store is opening next week, and the owner is deciding how to price one of the toys. The equation $S = -32p^2 + 960p$ predicts the total sales S as a function of the toy's price p , where S and p are in dollars. What price will produce the highest total sales?
- 48. A rectangular prism has a volume of $6x^4 - 13x^3 - 5x^2$. What expressions can represent the dimensions of the prism? Use factoring.

Extended Response

49. The box-and-whisker plots below show the points scored by two college football teams in games over the course of one season.



What do the medians tell you about each team's points per game?

- 50. Natalia spent \$153 of her savings at the mall. She bought clothes, a few paperback novels, and an \$18 DVD. She spent 4 times as much on clothes as she did on the paperbacks.
 - a. Write an equation that can be used to determine how much money Natalia spent on the paperback novels.
 - b. Use the equation to determine how much Natalia spent on paperbacks.

$$43. -\frac{b}{2a} = -\frac{3}{2 \cdot 2} = \boxed{-\frac{3}{4}}$$

$$44. \frac{55 \text{ mi}}{\text{hr}} \cdot \frac{5280 \text{ ft}}{1 \text{ mi}} \cdot \frac{1 \text{ hr}}{60 \text{ min}} \cdot \frac{1 \text{ min}}{60 \text{ sec}} = \frac{55 \cdot 5280 \text{ ft}}{60 \cdot 60 \text{ sec}}$$

$$\approx \boxed{80.6 \text{ ft/sec}}$$

$$40 \text{ min} \cdot \frac{60 \text{ sec}}{1 \text{ min}} = 2400 \text{ sec}$$

$$\times 80.6 \text{ ft} = \boxed{19,344 \text{ ft}}$$

$$45. w = l - 10 \quad P = 2w + 2l$$

$$P = 36 \quad 36 = 2(l - 10) + 2l$$

$$36 = 2l - 20 + 2l$$

$$36 = 4l - 20$$

$$56 = 4l$$

$$14 = l$$

46. biased \rightarrow "delicious" steak vs. "ordinary" meatloaf.

$$\frac{46}{4} = \frac{4l}{4}$$

$$11.5 = l$$

$$1.5 = w \rightarrow w = 11.5 - 10 = 1.5$$

$$47. S = -32p^2 + 960p$$

$$-\frac{b}{2a} = \frac{-960}{2(-32)} = \boxed{15}$$

not necessary

$$S = -32(15)^2 + 960(15)$$

$$= -7200 + 14400$$

$$S = \boxed{\$7200}$$

price: $\boxed{\$15}$

49. Team B's points per game were usually lower than Team A's.

$$50. \begin{cases} C + P + 18 = 153 \\ C + P = 135 \\ 4P = C \\ 5P = \frac{135}{5} \end{cases}$$

$$\begin{cases} 4P = C \\ 5P = 27 \end{cases} \rightarrow P = 27$$

$$C = 108$$

$$48. 6x^4 - 13x^3 - 5x^2$$

$$x^2(6x^2 - 13x - 5)$$

$$x^2(x^2 - 13x - 30)$$

$$x^2(x - \frac{3}{6})(x - \frac{10}{6}) \rightarrow \boxed{x^2(2x - 1)(3x - 5)}$$