



Beginning-of-Year Assessment

1. Jacob's age is two years more than the sum of the ages of his siblings Becky and Micah. Which equation represents Jacob's age?
 - (A) $z = x + y - 2$; x represents Micah's age, y represents Becky's age, and z represents Jacob's age.
 - (B) $x = y + z + 2$; x represents Jacob's age, y represents Micah's age, and z represents Becky's age.
 - (C) $x = 2 + y + z$; x represents Becky's age, y represents Jacob's age, and z represents Micah's age.
 - (D) $y = x + z - 2$; x represents Jacob's age, y represents Becky's age, and z represents Micah's age.
2. What is the solution of $-83 = \frac{b}{4}$?
 - (A) $b = -332$
 - (B) $b = -87$
 - (C) $b = -79$
 - (D) $b = -20.75$
3. Ramona works in a clothing store where she earns a base salary of \$140 per day plus 14% of her daily sales. She sold \$600 in clothing on Saturday and \$1,200 in clothing on Sunday. How much did she earn over the two days?
 - (A) \$252
 - (B) \$291
 - (C) \$392
 - (D) \$532
4. Solve the equation below for y .
$$6x - 3y = 36$$
 - (A) $y = 2x - 12$
 - (B) $y = 12 - 2x$
 - (C) $y = \frac{1}{2}x + 6$
 - (D) $y = 6 - \frac{1}{2}x$
5. The equation $3w + 4j = 39$ is used to determine the number of water bottles w and the number of juice bottles j that can be bought for \$39. If you purchase 6 bottles of juice, how many bottles of water can you buy?
 - (A) 3
 - (B) 5
 - (C) 15
 - (D) 17
6. The formula for the area of a triangle is $A = \frac{1}{2}bh$, where b is the base of the triangle, and h is the height of the triangle. What is the length of the base if the area is 32 cm^2 and the height is 4 cm?
 - (A) 4 cm
 - (B) 8 cm
 - (C) 16 cm
 - (D) 18 cm

7. The formula for the volume V of a rectangular prism is $V = \ell wh$, where ℓ represents the length, w represents the width, and h represents the height. Rearrange the quantities in this formula to give a new formula for the width of the rectangular prism.

- (A) $w = \frac{Vh}{\ell}$
(B) $w = \frac{\ell h}{V}$
(C) $w = \frac{V\ell}{h}$
(D) $w = \frac{V}{\ell h}$
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8. Which number is a solution of the inequality $8 - \frac{1}{4}b \geq 27$?

- (A) -76
(B) -80
(C) -86
(D) -140
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9. Suppose it takes you 12 min to walk from home to school at a rate of 260 ft/min. Your friend lives closer to school than you do. Which inequality represents the distance d (in feet) that your friend lives from school?

- (A) $d < 260$
(B) $d > 260$
(C) $d > 3120$
(D) $d < 3120$

10. What are the solutions of the compound inequality $2d + 3 \leq -11$ or $3d - 9 > 15$?

- (A) $d \leq -7$ or $d > 8$
(B) $d \leq -4$ or $d > 2$
(C) $d \leq -7$ or $d > 2$
(D) $d \leq -4$ or $d > 8$
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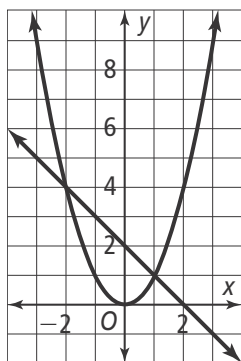
11. What are the solutions of $|3x + 2| > 9$?

- (A) $x > -\frac{11}{3}$ or $x > \frac{7}{3}$
(B) $x < -\frac{11}{3}$ or $x > \frac{7}{3}$
(C) $x > -\frac{11}{3}$ or $x < \frac{7}{3}$
(D) $x < -\frac{11}{3}$ or $x < \frac{7}{3}$
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12. Which of the following functions describes the sequence 4, -2 , 1, $-\frac{1}{2}$, $\frac{1}{4}$, ...?

- (A) $f(1) = 4$, $f(n + 1) = -2f(n)$
for $n \geq 1$
(B) $f(1) = 4$, $f(n + 1) = f(n) - 2$
for $n \geq 1$
(C) $f(1) = 4$, $f(n) = \frac{1}{2}f(n + 1)$
for $n > 1$
(D) $f(1) = 4$, $f(n) = -\frac{1}{2}f(n - 1)$
for $n > 1$

13. The graph below shows where the two functions $y = f(x)$ and $y = g(x)$ intersect. What are the solutions of the equation $f(x) = g(x)$?



- Ⓐ $-2, 1$
- Ⓑ $2, 0$
- Ⓒ $4, 1$
- Ⓓ $-2, 0, 1, 4$

14. Which function describes the table of values?

x	-2	0	2	4
$f(x)$	-7	-1	5	11

- Ⓐ $f(x) = 1 - 3x$
- Ⓑ $f(x) = x - 5$
- Ⓒ $f(x) = 3x - 1$
- Ⓓ $f(x) = 4x + 1$

15. A catalog-printing company receives a total amount C for each print job, which includes a setup charge S and a \$0.06 charge per page p for each job. Which rule describes the situation?

- Ⓐ $C = 0.06p$
- Ⓑ $C = S + 0.06p$
- Ⓒ $C = 0.06S + p$
- Ⓓ $C = 0.06(S + p)$

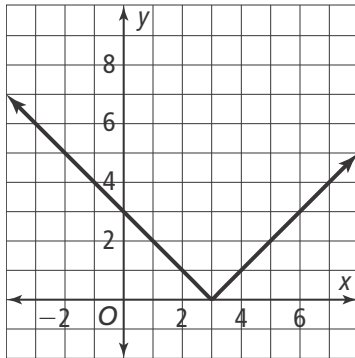
16. Dylan walks into a video arcade with a pocketful of quarters. He spends them at a rate of nine every half hour until he runs out. If the number of quarters Dylan has is graphed over time, which feature of the graph corresponds to Dylan's initial number of quarters before he spends the first one?

- Ⓐ the y -intercept
- Ⓑ the slope
- Ⓒ the x -intercept
- Ⓓ the minimum value

17. The changing speed of a car is modeled by the function $S(t) = -4t + 35$, where t is time in seconds. Interpret the model.

- Ⓐ The car has an initial speed of 0 units and is speeding up to a speed of 35 units by 4 units per second.
- Ⓑ The car has an initial speed of 4 units and is speeding up by 35 units per second.
- Ⓒ The car has an initial speed of 35 units and is slowing down by 4 units per second.
- Ⓓ The car has an initial speed of 35 units and is speeding up by 4 units per second.

18. Which function is shown in the following graph?



- (A) $f(x) = |x| + 3$
 (B) $f(x) = |x - 3|$
 (C) $f(x) = |x + 3|$
 (D) $f(x) = |x| - 3$

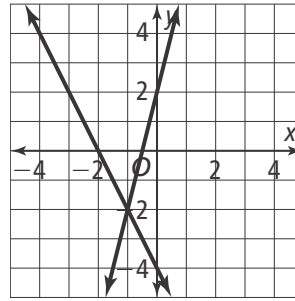
19. Which of the following is an equation of the line that passes through the point $(-2, 3)$ and is perpendicular to the graph of the equation $y = 3x - 2$?

- (A) $y = -\frac{1}{3}x + \frac{7}{3}$
 (B) $y = -\frac{1}{3}x + \frac{11}{3}$
 (C) $y = 3x + 9$
 (D) $y = 3x - 3$

20. Holly is trying to save \$25,000 to put a down payment on a condominium. If she starts with \$10,000 saved and saves an additional \$750 each month, which equation represents how far Holly is from her goal of reaching \$25,000? Let x stand for months and y stand for dollars.

- (A) $y = 25,000 - 750x$
 (B) $y = 15,000 - 750x$
 (C) $y = 750x - 10,000$
 (D) $y = 750x + 10,000$

21. What is the solution of the system of linear equations in the graph shown?



- (A) $(-2, -1)$
 (B) $(-2, 0)$
 (C) $(-1, -2)$
 (D) $(0, 2)$

22. Suppose you have 20 coins that total \$3.00. Some coins are nickels and some are quarters. Which of the following pairs of equations can you use to find out how many of each coin you have?

- (A) $n + q = 30$
 $5n + 25q = 20$
 (B) $n + q = 30$
 $n + q = 3.00$
 (C) $n + q = \frac{3.00}{20}$
 $0.05n + 0.25q = 3.00$
 (D) $n + q = 20$
 $5n + 25q = 300$

23. Compare the line passing through the points $(-2, -9)$ and $(4, 6)$ with the line given by the equation $y = \frac{2}{5}x - 4$.
- (A) They have the same slope.
 (B) They have the same x-intercept.
 (C) The two lines are perpendicular.
 (D) They have the same y-intercept.

24. What is the simplified form of

$$\frac{4x^{-2}}{(3y)^{-3}}?$$

- (A) $\frac{3y^3}{4x^2}$
(B) $\frac{108y^3}{x^2}$
(C) $108x^2y^3$
(D) $\frac{1}{108x^2y^3}$
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25. What is the missing value in $x^2y^8 \cdot x^3y^? = x^5y^5$?

- (A) -13
(B) -3
(C) 3
(D) 13
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26. What is the simplified form of

$$\frac{(4m^2n^{-3})^2 \cdot 12n^{13}}{8m^{20}}?$$

- (A) $\frac{7n^8}{2m^{24}}$
(B) $\frac{12n^7}{2m^{16}}$
(C) $\frac{8n^{23}}{m^{24}}$
(D) $\frac{24n^7}{m^{16}}$
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27. If the perimeter of a triangle is $9x + 7y$, and two of the sides are $2x + 3y$ and $4x - y$, which is the third side?

- (A) $3x + 5y$
(B) $x + 4y$
(C) $3x + 4y$
(D) $x + 5y$

28. Which exponential function is represented by the table below?

x	-2	0	2	4
y	16	4	1	$\frac{1}{4}$

- (A) $4 \cdot 2^x$
(B) $\frac{1}{4} \cdot 4^x$
(C) $4 \cdot \frac{1}{2}^x$
(D) $4 \cdot \frac{1}{4}^x$
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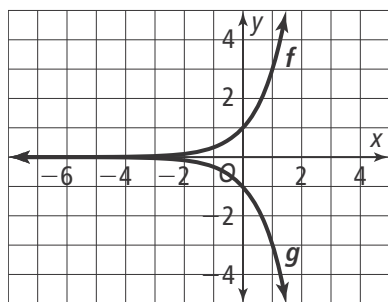
29. What is the simplified form of $(2b^2 - 6) + (4b + 7) - (b^2 + 5b - 3)$?

- (A) $3b^2 + 9b - 2$
(B) $3b^2 - b + 4$
(C) $b^2 - b + 4$
(D) $b^2 + 9b - 2$
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30. The length of a box is 1 cm more than its width. The height of the box is 8 cm greater than the width. The dimensions can be represented by x , $x + 1$, and $x + 8$. Multiply the dimensions, and find the greatest common factor (GCF) of the terms.

- (A) x^4
(B) x^3
(C) x^2
(D) x

31. Compare the graphs of the two functions f and g , given that $f(x) = 3^x$. What is an equation for g ?



- Ⓐ $g(x) = (-3)^x$
 Ⓑ $g(x) = -3^x$
 Ⓒ $g(x) = 3^x$
 Ⓓ $g(x) = \left(\frac{1}{3}\right)^{-x}$

32. What is the factored form of $x^2 + 12x - 64$?

- Ⓐ $(x - 4)(x + 16)$
 Ⓑ $(x - 2)(x + 32)$
 Ⓒ $(x + 4)(x - 16)$
 Ⓓ $(x - 6)(x + 18)$

33. What is the factored form of $25b^2 - 60b + 36$?

- Ⓐ $(6b - 5)^2$
 Ⓑ $(5b - 6)^2$
 Ⓒ $(5b - 4)(5b - 9)$
 Ⓓ $(5b - 12)(5b - 3)$

34. Factor $6x^2 + 28x + 16$.

- Ⓐ $(3x + 4)(2x + 4)$
 Ⓑ $(6x + 8)(x + 2)$
 Ⓒ $2(x + 8)(3x + 1)$
 Ⓓ $2(3x + 2)(x + 4)$

35. What is the width of the rectangle shown?

$$4x + 3$$

$$A = 8x^2 - 10x - 12$$

- Ⓐ $4x - 4$
 Ⓑ $2x - 15$
 Ⓒ $2x - 4$
 Ⓓ $4x - 15$

36. Which group of expressions could represent the dimensions of a rectangular prism with a volume of $2y^3 + 15y^2 + 28y$?

- Ⓐ $y, y + 4, 2y + 7$
 Ⓑ $y, y + 7, 2y + 4$
 Ⓒ $y, y + 2, 2y + 14$
 Ⓓ $y, y + 14, 2y + 2$