1. The quotient of $\frac{28x^4y^2}{14xy}$ is

   A. $2x^3y$ B. $2x^4y^3$

   C. $14x^3y$ D. $14x^4y^2$

2. Express $9 - y^2$ as the product of two binomial factors.

3. What are the factors of $x^2 - 5x + 6$?

   A. $(x + 2)$ and $(x + 3)$

   B. $(x - 2)$ and $(x - 3)$

   C. $(x + 6)$ and $(x - 1)$

   D. $(x - 6)$ and $(x + 1)$

4. When $3x^2 - 6x$ is divided by $3x$, the result is

   A. $-2x$ B. $2x$ C. $x + 2$ D. $x - 2$

5. Express the product in lowest terms: $\frac{x^2 - x - 6}{3x - 9} \cdot \frac{2}{x + 2}$

6. If $a > 0$, then $\sqrt{9a^2 + 16a^2}$ equals

   A. $\sqrt{7a}$ B. $5\sqrt{a}$ C. $5a$ D. $7a$

7. When $5\sqrt{20}$ is written in simplest radical form, the result is $k\sqrt{5}$. What is the value of k?

   A. 20 B. 10 C. 7 D. 4

8. What is the solution set of the equation $x^2 + 2x - 15 = 0$?

   A. $\{3, -5\}$ B. $\{-3, 5\}$

   C. $\{-3, -5\}$ D. $\{3, 5\}$

9. Solve for p in terms of r, s, and t: $rp + s = t$

10. In the equation $A = p + prt$, t is equivalent to

    A. $\frac{A - pr}{p}$ B. $\frac{A - p}{pr}$

    C. $\frac{A}{pr} - p$ D. $\frac{A}{p} - pr$

11. Which equation is equivalent to $3x + 4y = 15$?

    A. $y = \frac{15 - 3x}{4}$ B. $y = \frac{3x - 15}{4}$

    C. $y = 15 - 3x$ D. $y = 3x - 15$

12. Find, to the *nearest tenth*, the positive value of x in the equation $\sqrt{x^2 + 21} = 2x$.

13. What is the solution set of $\sqrt{4x + 21} = x$?

A. $\{-3\}$ B. $\{-3, 7\}$

C. $\{7\}$ D. $\{\ \}$

14. Which statement is equivalent to the inequality $9 - 4x \leq 3x - 5$?

A. $x > -2$ B. $x < 2$

C. $x \leq -2$ D. $x \geq 2$

15. In a science fiction novel, the main character found a mysterious rock that decreased in size each day. The table below shows the part of the rock that remained at noon on successive days.

Day	Fractional Part of the Rock Remaining
1	1
2	$\frac{1}{2}$
3	$\frac{1}{4}$
4	$\frac{1}{8}$

Which fractional part of the rock will remain at noon on day 7?

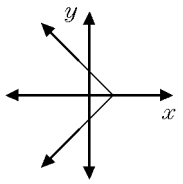
A. $\frac{1}{128}$ B. $\frac{1}{64}$ C. $\frac{1}{14}$ D. $\frac{1}{12}$

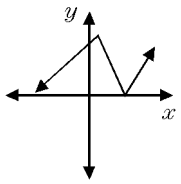
16. In the set of real numbers, what is the domain of $f(x) = \sqrt{x + 5}$?

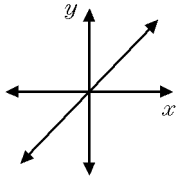
A. $x \geq -5$ B. $x \leq -5$

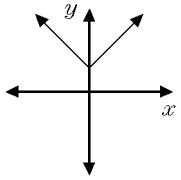
C. $x > -5$ D. $x > 0$

17. Which is a graphic representation of "y varies directly as x"?

A. 

B. 

C. 

D. 

18. If y varies directly as x and $y = 5$ when $x = 6$, find y when $x = 18$.

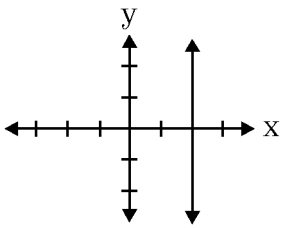
19. If the point $(3, k)$ is on the graph of the equation $x + 2y = 15$, what is the value of k?

20. What is the slope of the line that passes through the points $(-6, 1)$ and $(4, -4)$?

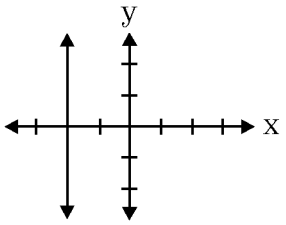
A. -2 B. 2 C. $-\frac{1}{2}$ D. $\frac{1}{2}$

21. Which graph represents the graph of the equation $x = 2$?

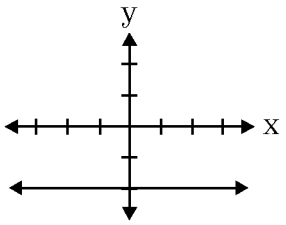
A.



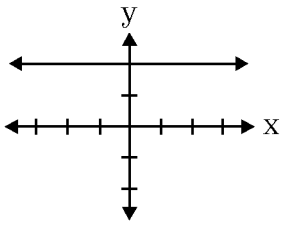
B.



C.



D.



22. If the slope of $\overleftrightarrow{JK}$ is $\frac{3}{4}$ and $\overleftrightarrow{JK} \perp \overleftrightarrow{PQ}$, what is the slope of $\overleftrightarrow{PQ}$?

23. Which is an equation of the line that is parallel to $y = 3x - 5$ and has the same y-intercept as $y = -2x + 7$?

A. $y = 3x - 2$ B. $y = -2x - 5$

C. $y = 3x + 7$ D. $y = -2x - 7$

24. Which equation represents the circle whose center is $(3, -1)$ and whose radius is $\sqrt{6}$?

A. $(x + 3)^2 + (y - 1)^2 = 36$

B. $(x - 3)^2 + (y + 1)^2 = 36$

C. $(x + 3)^2 + (y - 1)^2 = 6$

D. $(x - 3)^2 + (y + 1)^2 = 6$

25. Solve the following system of equations algebraically and check:

$$2x = 5y + 8$$
$$3x + 2y = 31$$

26. Which coordinates represent a point in the solution set of the system of inequalities shown below?

$$y \leq \frac{1}{2}x + 13$$
$$4x + 2y > 3$$

A. $(-4, 1)$ B. $(-2, 2)$

C. $(1, -4)$ D. $(2, -2)$

27. In a baseball game, the ball traveled 350.7 feet in 4.2 seconds. What was the average speed of the ball, in feet per second?

A. 83.5 B. 177.5

C. 354.9 D. 1,472.9

28. The Eye Surgery Institute just purchased a new laser machine for $500,000 to use during eye surgery. The Institute must pay the inventor $550 each time the machine is used. If the Institute charges $2,000 for each laser surgery, what is the minimum number of surgeries that must be performed in order for the Institute to make a profit?