Sample Assessment Items for Math 010

Key

1. Solve: $5(x + 5) - 7 = -7x + 18 + 12x$
   
   Answer: All real numbers

2. Solve: $-(5 + x) + 3 - 4x > 8$
   
   Answer: $x < 2$ (or $2 > x$)

3. Solve the system of linear equations:
   
   $\frac{1}{5}x - \frac{1}{4}y = 3$
   $4x - 5y = 20$
   
   Answer: No solution

4. Solve: $1 - \frac{2x-6}{x^2-9} = -\frac{4}{x+3}$
   
   Answer: $x = -5$

5. Solve: $x(x - 3) = 4$
   
   Answer: $x = 4, x = -1$

6. Solve: $a^2 + 18 = 10a$
   
   Answer: $a = 5 \pm \sqrt{7}$

7. Solve: $(x - 3)^2 = 24$
   
   Answer: $x = 3 \pm 2\sqrt{6}$

8. Solve for $c$: $\frac{a}{c} = \frac{b}{d}$
   
   Answer: $c = \frac{ad}{b}$
9. Solve for $y$: $-5x + 7y = 3$

Answer: $y = \frac{5}{7}x + \frac{3}{7}$

10. Graph the line $3x - 4y = 24$.

Answer:

![Graph of the line $3x - 4y = 24$.]

11. Find the $x$ and $y$-intercepts of the line $2x + 7y = 10$.

Answer: $x$-intercept is $(5,0)$ and $y$-intercept is $(0, \frac{10}{7})$.

12. Find the equation of the line with a slope of $\frac{1}{2}$ containing the point $(-2,4)$.

Answer: $y = \frac{1}{2}x + 5$ or $y - 4 = \frac{1}{2}(x + 2)$

13. The linear equation $y = 0.25x + 7$ can be used to model the cost of a textbook (in dollars), $y$, containing $x$ pages. What does the slope of the graph represent?

Answer: For every page added to the book, the cost increases $0.25$.

14. A rectangular carpet has a perimeter of 204 inches. The length of the carpet is 30 inches more than the width. Find the dimensions of the carpet.

Answer: width = 26 inches, length = 66 inches
15. The tuition for a class at a local university increased 6%. The new tuition cost is $5830. What was the cost for tuition before the increase?

Answer: $5500

16. How many liters each of a 5% silver iodide solution and a 20% silver iodide solution must be mixed to get 30L of a 10% solution?

Answer: 20L of 5% silver iodide solution and 10L of 20% silver iodide solution

17. Carly and Evie are riding bicycles in the same direction. Carly rides at a speed of 3 mph while Evie rides at a speed of 9 mph. If they start at the same place (and at the same time), how long until they will be 30 miles apart?

Answer: 5 hours

18. Simplify: \((2x^2y^{-1})^{-3} \cdot 2x^4\)

Answer: \(\frac{y^3}{4x^2}\)

19. Factor: \(6x^2 + 17x - 3\)

Answer: \((6x - 1)(x + 3)\)

20. Factor: \(32 - 2x^2\)

Answer: \(2(4 + x)(4 - x)\)

21. Simplify: \((-5x^5y^3 + 3xy) - (2x^5y^3 + 6xy)\)

Answer: \(-7x^5y^3 - 3xy\)

22. Multiply: \((5x - 2)(3x^2 - 4x + 2)\)

Answer: \(15x^3 - 26x^2 + 18x - 4\)
23. Subtract: \( \frac{a+8}{a} - \frac{y-8}{y} \)

Answer: \( \frac{8(y+a)}{ay} \)

24. Simplify: \( \frac{x^2+5x-6}{x^2-1} \cdot \frac{x^2+x}{x^2+12x} \)

Answer: \( \frac{x+6}{x+12} \)

25. Simplify: \( \frac{x-y}{y^2} \cdot \frac{y^2}{x^2-1} \)

Answer: \( \frac{1}{x+y} \)

26. Find the domain of \( f(x) = \frac{x-3}{x+4} \)

Answer: \( (-\infty, -4) \cup (-4, \infty) \)

27. Simplify: \( 5\sqrt{27x^4} - x\sqrt{75x^2} \). Assume \( x \) represent a positive real number.

Answer: \( 10x^2\sqrt{3} \)

28. Simplify: \( (27x^3y^5)^{\frac{1}{3}} \)

Answer: \( 3xy^{\frac{5}{3}} \) or \( 3x^3\sqrt[3]{y^5} \)

29. Expand: \( (\sqrt{x} + 7)^2 \). Assume \( x \) represent a positive real number.

Answer: \( x + 14\sqrt{x} + 49 \)

30. Simplify: \( \sqrt{6x} \left( 3 + \sqrt{2x} \right) \). Assume \( x \) represent a positive real number.

Answer: \( 3\sqrt{6x} + 2x\sqrt{3} \)
31. Rationalize and simplify: \( \frac{3 + \sqrt{2}}{\sqrt{3}} \)

Answer: \( \frac{3 \sqrt{3} + \sqrt{6}}{3} \)