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: $\begin{array}{l} \frac{1}{5}x - \frac{1}{4}y = 3 \\ 4x - 5y = 20 \end{array}$

   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: $\frac{a}{c} = \frac{b}{d}$

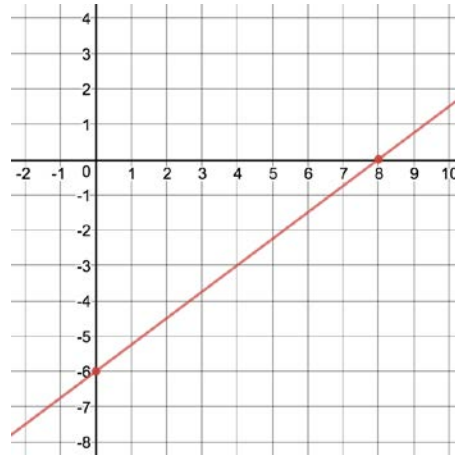   Answer: $c = \frac{ad}{b}$

9. Solve for y: $-5x + 7y = 3$

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

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

Answer:

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

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

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% siler 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: $\dfrac{a+8}{a} - \dfrac{y-8}{y}$

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

24. Simplify: $\dfrac{x^2+5x-6}{x^2-1} \cdot \dfrac{x^2+x}{x^2+12x}$

 Answer: $\dfrac{x+6}{x+12}$

25. Simplify: $\dfrac{\dfrac{x-y}{y^2}}{\dfrac{x^2}{y^2}-1}$

 Answer: $\dfrac{1}{x+y}$

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

 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 $3x\sqrt[3]{y^5}$

29. Expand: $\left(\sqrt{x} + 7\right)^2$. 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: $\dfrac{3+\sqrt{2}}{\sqrt{3}}$

Answer: $\dfrac{3\sqrt{3}+\sqrt{6}}{3}$