

Math C Prerequisite Exercises

1. Find solutions for the following. Simplify your answers:

$$a. \frac{x}{x-5} + \frac{2}{x-1} = \frac{-4}{x^2 - 6x + 5} \quad b. -3^2 - 2(5 - 2x) = 7 - 3(2x + 5) \quad c. 15x^2 + 13x = 6$$

$$d. \frac{x}{4} = \frac{x-1}{x} \quad e. 2(3x-4) - 8x = 5 - 2(x-9) + 6 \quad f. \frac{2x}{x+2} = \frac{x}{x+3} - \frac{3}{x^2 + 5x + 6}$$

2. Perform the operations and simplify:

$$a. (3x-7)(6x+5) \quad b. \left(\frac{3^3}{3^{-1}}\right)^2 - \left(\frac{3^{-2}}{3^{-3}}\right)^2 \quad c. (9x-11)(9x+11) \quad d. (7xy^3)(-3xy^2) \quad e. (7x-3)^2$$

$$f. \left(\frac{-51x^6y^5}{34x^2y^7}\right)^3 \left(\frac{4x^2}{6y^3}\right) \quad g. (4x^3 - 7x^2 + 2x - 9) - (5x^3 - 9x + 10) \quad h. \frac{x}{5x^2 - 9x - 2} - \frac{2}{3x^2 - 7x + 2}$$

$$i. \frac{x^2 - 11x + 30}{2x^2 - 7x - 15} \cdot \frac{x^2 - 2x - 24}{x^2 - x - 20}$$

$$j. \frac{\frac{1}{x^2} - \frac{3}{x}}{\frac{1}{x^2} + 3}$$

3. Evaluate $\frac{z - y^2 - 5(x - y)}{3 - 2(z - x)^2 - y} - z$ for $x = -1$, $y = -2$, $z = -3$

4. Factor completely, if possible: a. $x^2 - 5x - 6$ b. $18x^2 - 23x - 6$ c. $9x^4 - 36x^3 + 6x^2 - 24x$
 d. $76rs - 19r^3s$ e. $64x^3 + 1$ f. $3x^2 + 12x - 36$

5. Given: $5x + 3y = 10$

a. Find the intercepts and 4 additional points on the line b. Graph the line c. Find the **slope** of the line.

6. Find the equation of the line containing $(2, -3)$ and $(-4, 4)$ in slope-intercept, standard, point-slope forms

7. Set up an equation to represent the following exercises. Solve each equation and find the answers.

- a. The length of a rectangle is five feet less than nine times the width. Find the length, width, and perimeter of the rectangle if the area is 4 square feet.
- b. Healthy Hanna has a vegetable cocktail made of 4% wheat grass juice and another drink made of 1% wheat grass juice. How much of each drink should she use to create 15 cups of a new mixture containing 2% wheat grass juice?
- c. Hubert and Alma both leave San Francisco at 6 a.m. and drive east on I-80. If Hubert averages 42 miles per hour and Alma averages 53 miles per hour, at what time will they be 82.5 miles apart? How far will Alma be from San Francisco?
- d. Lemon drops cost \$1.90 per pound and jelly beans cost \$1.20 per pound. How many pounds of each candy should be combined to produce a 100-pound mixture that costs \$1.48 per pound?
- e. Which has a larger area, a circle with circumference of 150 yards or a square with a perimeter of 507.75 feet?
- f. Arnold can paint a room in 5 hours and Maria can paint the same room in 4 hours. How long would it take them to paint the room together?
- g. The stopping distance of a car, d , is directly proportional to the square of its speed, s . If a car traveling 50 miles per hour requires 170 feet to come to a stop, what is the stopping distance for a car traveling 70 miles per hour?
- h. When 5 times a number is added to 4 times the reciprocal of a number, the sum is 12. Find the number(s).