

1. Solve each of the following equations. Simplify your answers fully.

a. $2x - (5x - 3) = 3(x + 2)$

b. $5x(2x + 5)\left(\frac{2}{5}x - \frac{3}{4}\right) = 0$

c. $(x + 214)^2 - 3 = 4$

d. $x^2 + 14 = 9x$

e. $\frac{4x+5}{4} = -2x + 1$

f. $5x(2x + 5)\left(\frac{2}{5}x - \frac{3}{4}\right) = 0$

2. Find an equation of the line passing through the points $(3, -1)$ and $(-1, -4)$.

3. Solve the following system of equations **graphically**. Check your solution.

$$\begin{aligned} 2y - x &= 6 \\ y &= -\frac{3}{4}x - 2 \end{aligned}$$

4. Solve the following system of equations algebraically.

$$\begin{aligned} 3x + 4y &= 1 \\ 2x - 5y &= 3 \end{aligned}$$

5. Does the point $\left(\frac{3}{2}, -\frac{2}{3}\right)$ lie on the line $6x - 3y = 11$? Justify your answer.

6. (5 points) Factor each of the following polynomials completely. If the polynomial cannot be factored, write PRIME:

a. $3x^5 - 48x^3$

b. $-2x^3 + 6x^2 + 36x$

c. $x^2 - 64$

d. $x^2 + 36$

7. Find the slope and exact coordinates of the x and y intercepts of the line $4x + 5y = -30$.

8. Graph the lines $x = 4$ and $y = -3$.

9. Solve the equation $C = \frac{5}{9}(F - 32)$ for F in terms of C .

10. Tickets to a play cost \$6 when purchased in advance, and \$11 when purchased at the door. The number of tickets purchased in advance was 10 fewer than the number purchased at the door. The total revenue collected at the play was \$739. How many tickets were purchased in advance? How many were purchased at the door? Clearly state the meaning of any variables you use and include units in the definition. Answer this question with a sentence.

11. The height, H , of a baseball (in feet) above the ground t seconds after being thrown is given by

$$H = -16t^2 + 48t + 3.$$

a. Find the height of the baseball 1.5 seconds after being thrown.

b. When is the baseball 35 feet high?