

1. Perform the operations as indicated.

$$(a) \frac{3}{4} \cdot 6 - 5 \cdot \frac{5}{2} = -8$$

$$(b) \frac{\frac{5}{6} - \frac{5}{4}}{\frac{2}{3} \cdot \frac{5}{8}} = -1$$

2. Simplify each of the following.

$$(a) -2a^3(-2a^4)^2 = -8a^{11}$$

$$(b) 2a^3(-2ab^2)^3 ab^2 = -16a^7b^8$$

$$(c) \frac{(-2x)^2 y^3}{2x^3 y^2} = \frac{2y}{x}$$

$$(d) 3(x-2) - 2(5x-2) = -7x-2$$

$$(e) (x+3)(5x-3) = 5x^2 + 12x - 9$$

$$(f) (5a-1)^2 = 25a^2 - 10a + 1$$

$$(g) (3x^5 + 4y)(3x^5 - 4y) = 9x^{10} - 16y^2$$

$$(h) (x-y)(x^5 + x^4y + x^3y^2 + x^2y^3 + xy^4 + y^5) = x^6 - y^6$$

3. Solve each of the following equations. Make sure to check your solutions.

$$(a) \left(\frac{3}{8}\right)x + \frac{3}{2} = -\frac{3}{4} \quad -6$$

$$(b) 3(2x-3) - (5x+4) = -14 \quad -1$$

$$(c) 3w - 5 = 5(w-2) \quad \frac{5}{2}$$

$$(d) 8(x-3) - 3(5-2x) = x \quad 3$$

$$(e) 7(j-5) + 8 = 2(j+5) + 5j \quad \text{no solution}$$

$$(f) -3(2x-5) - (3-7x) = 2(x+1) - (x-10) \quad \text{all numbers are solution}$$

$$(g) \frac{3x-1}{4} + \frac{8-4x}{3} = -3-x \quad -13$$

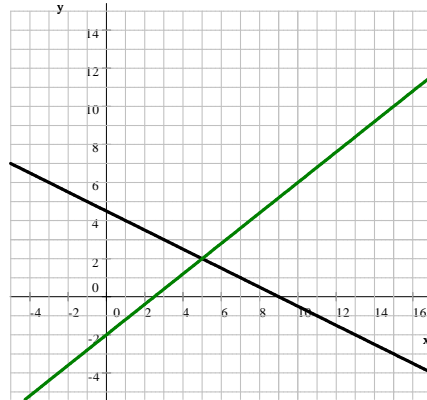
$$(h) \frac{3x-2}{5} + \frac{x+4}{3} = \frac{14(x+1)}{15} \quad \text{all numbers are solution}$$

4. Intercepts.

$$(a) \text{ Find the } x\text{-intercept of the line given by } 5x - y = -10. \quad (-2, 0)$$

$$(b) \text{ What is the } y\text{-intercept of the line with equation } 3x + 2y = 30? \quad (0, 15)$$

5. Graph the lines $4x - 5y = 10$ and $y = 5 - \frac{x+1}{2}$ in the same coordinate system. Use your graph to find the coordinates of the point where the lines intersect. **(5, 2)**



6. Word Problems.

- (a) A rectangle has a width which is seven inches less than its length. The perimeter is 46 inches. Find the sides. **8 in and 15 in**
- (b) A couch went on a 15% sale. The sale price is \$ 697. Find the original price. **\$ 820**
- (c) The difference between two numbers is 7, their sum is 37. Find these numbers. **15 and 22**
- (d) A certain triangle's longest side is one centimeter less than six times the shortest side. The other side is five times the shortest side. The perimeter is thirty-five centimeters. Find the length of the longest side. **17 cm**
- (e) Ann and Betty are roommates. The monthly rent is \$ 950. The amount paid by Ann is \$ 310 less than twice the amount paid by Betty. How much do they each pay for rent? **\$ 420 and \$ 530**
- (f) The population of a town has decreased from 90 000 to 82 800. What percent of a change does this represent? **8% decrease**
- (g) A bank teller has 47 more five-dollar bills than ten-dollar bills. The total value of the money is \$1000. How much of each denomination of bill does he have? **51 ten-dollar bills and 98 five-dollar bills**
- (h) One side of a rectangle is 4 ft shorter than three times the other side. Find the sides if the perimeter is 64 ft. **9 ft and 23 ft**
- (i) Mary bought four less than three times the number of books that Jose did. Together they bought sixteen books. How many did Jose buy? **5**