

**Math 70**  
**Final Exam Answers**

1. (a)  $\frac{1}{6} + \frac{2}{3} - \frac{8}{9} = \frac{3}{18} + \frac{12}{18} - \frac{16}{18}$   
 $= \boxed{-\frac{1}{18}}$

(b)  $\frac{2\frac{1}{6}}{\frac{3}{4}} = \frac{13}{6} \div \frac{3}{4}$  (Writing  $2\frac{1}{6}$  as an improper fraction)  
 $= \frac{13}{6} \cdot \frac{4}{3}$   
 $= \boxed{\frac{26}{9} \text{ or } 2\frac{7}{9}}$

(c)  $-5.1 + 6.83 = \boxed{1.73}$

(d)  $3(-2) + 4(3-4)^2 = 3(-2) + 4(-1)^2$  (PEMDAS)  
 $= 3(-2) + 4$   
 $= -6 + 4$   
 $= \boxed{-2}$

2. (a)  $5.92 \times 10^{-6} = \boxed{0.00000592}$

(b)  $5,910,000,000 = \boxed{5.91 \times 10^9 \text{ kilometers}}$

3. Since  $\frac{45}{120} = \frac{3}{8} = 0.375$ , the percentage of blue cars out of the 120 cars is  $\boxed{37.5\%}$ .

4. Discount = 40% or \$70 =  $0.4(70) = 28 \Rightarrow$  Sale price =  $70 - 28 = \$42$ .

The discount is \$28 and the sale price is \$42.

5.  $\frac{\$60}{1} \cdot \frac{1 \text{ Euro}}{\$1.50} = \frac{60}{1.50} \text{ Euros} = \boxed{40 \text{ Euros}}$

6. (a) Subtracting 9.1 from both sides:  $\boxed{1.9 = x}$

(b) Multiplying both sides by  $\frac{3}{2}$  (or dividing both sides by  $\frac{2}{3}$ ):  
 $\Rightarrow t = 10 \cdot \frac{3}{2} \Rightarrow \boxed{t = 15}$

(c) Distributing:  $3x + 3 - 5 = 5x + 2 \Rightarrow 3x - 2 = 5x + 2 \Rightarrow -4 = 2x$   
 $\boxed{-2 = x}$

(d) Clearing fractions by multiplying both sides (all terms) by 15:  $30y + 5 = 11$   
 $30y = 6 \Rightarrow y = \frac{6}{30} \Rightarrow \boxed{y = \frac{1}{5}}$

7. (a) FOIL:  $(2x + 3)(x - 2) = 2x^2 - 4x + 3x - 6$   
 $= \boxed{2x^2 - x - 6}$

(b) Distributing:  $3y(y^4 - y + 2) = \boxed{3y^5 - 3y^2 + 6y}$

(c)  $(6x^2 - 2x + 8) - (x^2 - 3x - 1) = 6x^2 - 2x + 8 - x^2 + 3x + 1$   
 $= \boxed{5x^2 + x + 9}$

(d) Evaluating at  $w = 2$ :  $2(2)^3 - 5(2) - 9 = 2(8) - 5(2) - 9$   
 $= 16 - 10 - 9$   
 $= \boxed{-3}$

8. (a)  $8^{-2} = \frac{1}{8^2} = \boxed{\frac{1}{64}}$

(b)  $(-2x^2y)^3 = (-2)^3(x^2)^3y^3$   
 $= \boxed{-8x^6y^3}$

(c)  $5^0 = \boxed{1}$

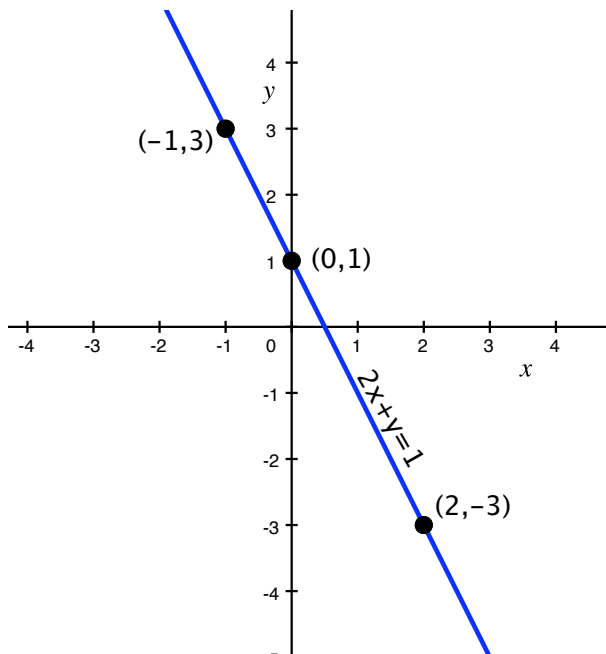
(d)  $\frac{15a^2b^2}{3a^2b^8} = 5a^0b^{-6}$   
 $= \boxed{\frac{5}{b^6}}$  (since  $a^0 = 1$ )

9. Average speed =  $\frac{440 \text{ miles}}{8 \text{ hours}} = 55 \text{ miles per hour}$       You travel an average of  $\boxed{55 \text{ mph.}}$

10. (a) Evaluating at  $x = 2$  and solving for  $y$ :  $2(2) + y = 1 \Rightarrow y = -3 \Rightarrow \boxed{(2, -3)}$   
Evaluating at  $y = 3$  and solving for  $x$ :  $2x + 3 = 1 \Rightarrow x = -1 \Rightarrow \boxed{(-1, 3)}$

(b) You can use the points from part (a). To get a third point, you can choose any  $x$  or  $y$  value (different than those in part (a)) and complete the ordered-pair solution with that value. For convenience, I will choose  $x = 0$  and complete the ordered-pair  $(0, ?)$ .  $\Rightarrow (0, 1)$

Plotting these three points and drawing the line for the linear equation gives the following graph:



Note about the graph: There should be arrow heads on my axes and my line. (This is difficult to format on my computer.)

11. **Unknowns:** Length of Long Piece =  $L$       Length of Short Piece =  $L - 9$

**Equation:** Length of Long Piece + Length of Short Piece = 40

$$L + L - 9 = 40$$

$$\Rightarrow 2L - 9 = 40 \Rightarrow 2L = 49 \Rightarrow L = 24.5$$

The long piece is 24.5 feet long and the short piece is 15.5 feet long.

12. **Unknowns:** Width =  $W$       Length =  $3W$

**Equation:** Sum of all four sides of the garden = 120

$$W + 3W + W + 3W = 120 \Rightarrow 8W = 120 \Rightarrow W = 15$$

The width of the garden will be 15 feet and the length will be 45 feet.