

Math 70
Final Exam Answers

1. (a) $\frac{1}{3} - \frac{5}{6} + \frac{7}{9} = \frac{6}{18} - \frac{15}{18} + \frac{14}{18}$
 $= \boxed{\frac{5}{18}}$

(b) $\frac{1\frac{5}{7}}{\frac{1}{4}} = \frac{12}{7} \div \frac{1}{4}$ (Writing $1\frac{5}{7}$ as an improper fraction)
 $= \frac{12 \cdot 4}{7 \cdot 1}$
 $= \boxed{\frac{48}{7} \text{ or } 6\frac{6}{7}}$

(c) $-7.2 + 9.56 = \boxed{2.36}$

(d) $3 + 5(3 - 4)^2 = 3 + 5(-1)^2$ (PEMDAS)
 $= 3 + 5(1)$
 $= 3 + 5$
 $= \boxed{8}$

2. (a) $2.178 \times 10^6 = \boxed{2,178,000}$

(b) $0.000000278 = \boxed{2.78 \times 10^{-7} \text{ millimeters}}$

3. Since $\frac{100}{180} = \frac{5}{9} = 0.55\bar{5}$, the percentage of boys out of the 180 kids is approximately $\boxed{56\%}$.

4. Discount = 70% of \$90 = $0.7(90) = 63 \Rightarrow$ Sale price = $90 - 63 = \$27$.

The discount is \$63 and the sale price is \$27.

5. $\frac{35 \text{ Euros}}{1} \cdot \frac{\$1}{0.7 \text{ Euros}} = \frac{35}{0.7} \text{ dollars} = \boxed{\$ 50}$

6. (a) Subtracting 6.3 from both sides: $\boxed{5.7 = x}$

(b) Multiplying both sides by $\frac{4}{3}$ (or dividing both sides by $\frac{3}{4}$):
 $\Rightarrow t = 12 \cdot \frac{4}{3} \Rightarrow \boxed{t = 16}$

(c) Distributing: $6x + 24 - 2x = x + 9 \Rightarrow 4x + 24 = x + 9 \Rightarrow 3x = -15$
 $\boxed{x = -5}$

(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: $(4x + 2)(x - 3) = 4x^2 - 12x + 2x - 6$
 $= \boxed{4x^2 - 10x - 6}$

(b) Distributing: $7y^2(y^3 - y + 3) = \boxed{7y^5 - 7y^3 + 21y^2}$

(c) $(5x^2 - 3x + 7) - (x^2 - 4x - 2) = 5x^2 - 3x + 7 - x^2 + 4x + 2$
 $= \boxed{4x^2 + x + 9}$

(d) Evaluating at $w = -1$: $2(-1)^3 + 6(-1) + 11 = 2(-1) + 6(-1) + 11$
 $= -2 - 6 + 11$
 $= \boxed{3}$

8. (a) $9^{-2} = \frac{1}{9^2} = \boxed{\frac{1}{81}}$

(b) $(8x^3y)^5 = 8^5(x^3)^5y^5$
 $= \boxed{8^5x^{15}y^5}$

(c) $(-2)^0 = \boxed{1}$

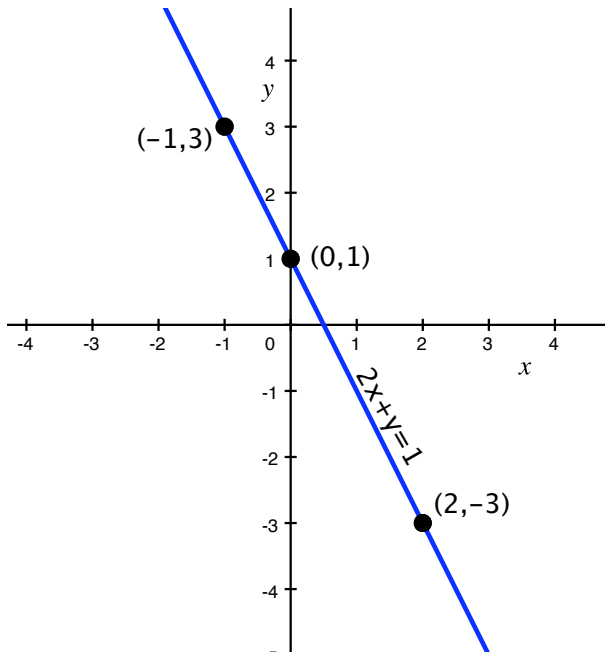
(d) $\frac{20a^3b^4}{4a^3b^6} = 5a^0b^{-2}$
 $= \boxed{\frac{5}{b^2}}$ (since $a^0 = 1$)

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 = $L - 11$

Equation: Length of Long Piece + Length of Short Piece = 50

$$L + L - 11 = 50$$

$$\Rightarrow 2L - 11 = 50 \quad \Rightarrow 2L = 61 \quad \Rightarrow L = 30.5$$

The long piece is 30.5 feet long and the short piece is 19.5 feet long.

12. **Unknowns:** Width = W Length = $4W$

Equation: Sum of all four sides of the garden = 150

$$W + 4W + W + 4W = 150 \quad \Rightarrow 10W = 150 \quad \Rightarrow W = 15$$

The width of the garden will be 15 feet and the length will be 60 feet.