

Use the given sets to find the following. Use the Venn diagram if you would like (optional). At least 2 answers MUST be written in interval notation.

$$A = \{x | x \in \mathbb{Z}, -4 < x \leq 2\}$$

$$A = -3, -2, -1, 0, 1, 2$$

$$B = \{x | x \in \mathbb{W}, -3 < x < 6\}$$

$$B = 0, 1, 2, 3, 4, 5$$

$$C = \{x | x \in \mathbb{N}, x \leq 8\}$$

$$C = 1, 2, 3, 4, 5, 6, 7, 8$$

$$1.) A' = \{3, 4, 5, 6, 7, 8\}$$

$$2.) A \cap B = \{0, 1, 2\}$$

$$3.) A' \cap C = \{3, 4, 5, 6, 7, 8\}$$

$$A' = 3, 4, 5, 6, 7, 8$$

$$C = 1, 2, 3, 4, 5, 6, 7, 8$$

$$4.) (A \cap B \cap C)' = \{-3, -2, -1, 0, 3, 4, 5, 6, 7, 8\}$$

$$A \cap B \cap C = 1, 2$$

$$5.) (B \cup C) \cap A' = \{3, 4, 5, 6, 7, 8\}$$

$$B \cup C = 0, 1, 2, 3, 4, 5, 6, 7, 8$$

$$A' = 3, 4, 5, 6, 7, 8$$

$$6.) (A \cup B)' \cap (A \cap B)' = \{6, 7, 8\}$$

$$A \cup B = -3, -2, -1, 0, 1, 2, 3, 4, 5$$

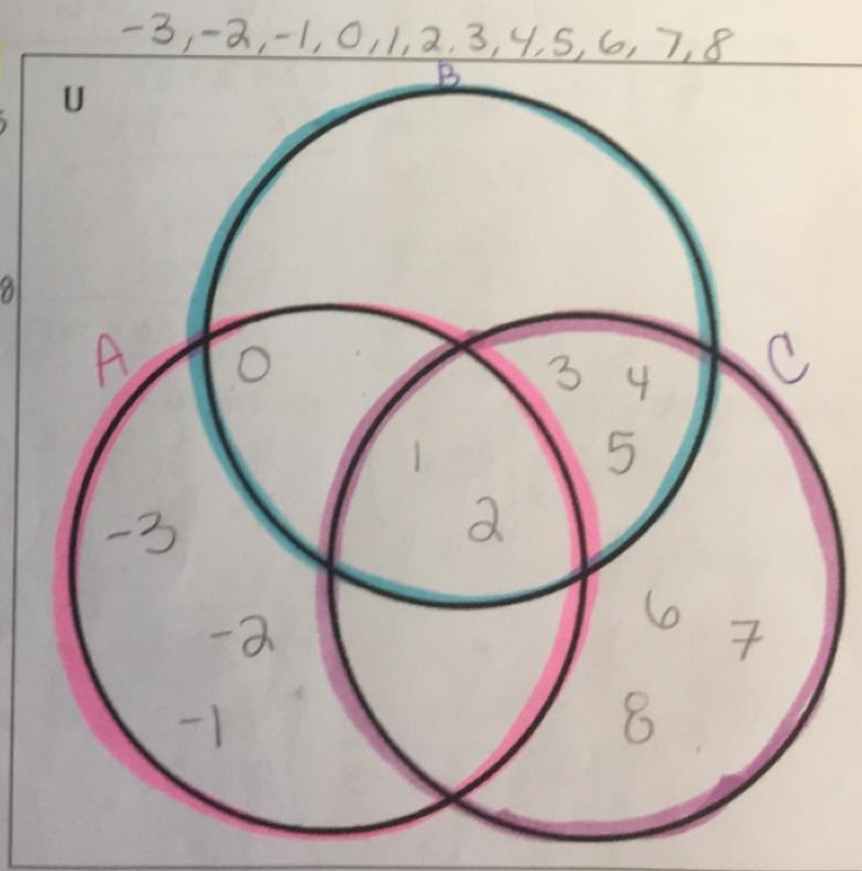
$$*(A \cup B)' = 6, 7, 8$$

$$A \cap B = 0, 1, 2$$

$$*(A \cap B)' = -3, -2, -1, 3, 4, 5, 6, 7, 8$$

$$7.) (A \cup C)' = \{3\}$$

$$A \cup C = -3, -2, -1, 0, 1, 2, 3, 4, 5, 6, 7, 8$$



Solve each equation for the variable. Show your work in a neat, organized manner. All fractional answers should be simplified as much as possible. Please circle your answers.

8.) $6x - 8 - 2x = -16 + 5x$

$$\begin{array}{r} 4x - 8 = -16 + 5x \\ -4x \quad -4x \\ \hline -8 = -16 + x \\ +16 \quad +16 \\ \hline 8 = x \end{array}$$

9.) $a + \frac{2}{7} = \frac{5}{2}$

$$\begin{array}{r} -\frac{2}{7} \quad -\frac{2}{7} \\ \hline a = \frac{5}{2} - \frac{2}{7} \\ a = \frac{35}{14} - \frac{4}{14} \\ a = \frac{31}{14} \end{array}$$

10.) $3 = 2y -$

$$\begin{array}{r} +13 \quad +13 \\ \hline 16 = 2y \\ \frac{16}{2} = \frac{2y}{2} \\ 8 = y \end{array}$$

11.) $\frac{x}{2} - 9 = 11$

$$\begin{array}{r} +9 \quad +9 \\ \hline 2 \cdot \left(\frac{x}{2} \right) = (20) \cdot 2 \\ x = 40 \end{array}$$

12.) $4(2x - 1) = -3(x + 2) + 11x$

$$\begin{array}{r} 8x - 4 = -3x - 6 + 11x \\ 8x - 4 = 8x - 6 \\ +6 \quad +6 \\ \hline 8x + 2 = 8x \\ -8x \quad -8x \\ \hline 2 = 0 \\ \text{false!} \\ \text{No solution} \end{array}$$

13.) $-\frac{3}{2}m = 18$

$$\begin{array}{r} -\frac{3}{2} \quad -\frac{3}{2} \\ \hline m = 18 \div -\frac{3}{2} \\ m = \frac{18}{1} \div -\frac{3}{2} \\ m = \frac{18}{1} \cdot \frac{2}{-3} \\ m = \frac{36}{-3} \\ m = -12 \end{array}$$

14.) $-\frac{2}{3}(4x - 5) = \frac{1}{2}(2x + 6)$

$$\begin{array}{r} -\frac{2}{3} \left(\frac{4}{1}x - \frac{5}{1} \right) = \frac{1}{2} \left(\frac{2x}{1} + \frac{6}{1} \right) \\ -\frac{8}{3}x + \frac{10}{3} = \frac{2x}{2} + \frac{6}{2} \\ -\frac{8}{3}x + \frac{10}{3} = x + 3 \\ +\frac{8}{3}x \quad +\frac{8}{3}x \\ \hline \frac{10}{3} = \frac{1}{1}x + \frac{8}{3}x + 3 \\ \frac{10}{3} = \frac{3}{3}x + \frac{8}{3}x + 3 \\ \frac{10}{3} = \frac{11}{3}x + 3 \\ -3 \quad -3 \\ \hline \frac{10}{3} - 3 = \frac{11}{3}x - 3 \\ \frac{10}{3} - \frac{9}{3} = \frac{11}{3}x - \frac{9}{3} \\ \frac{1}{3} = \frac{11}{3}x \\ \frac{1}{3} \cdot \frac{3}{11} = \frac{11}{3}x \cdot \frac{3}{11} \\ \frac{1}{11} = x \end{array}$$

15.) $4 = \frac{2}{9}(4n - 2)$

$$\begin{array}{r} 4 = \frac{2}{9} \left(\frac{4n}{1} - \frac{2}{1} \right) \\ 4 = \frac{8n}{9} - \frac{4}{9} \\ +\frac{4}{9} \quad +\frac{4}{9} \\ \hline \frac{4}{1} + \frac{4}{9} = \frac{8}{9}n \\ \frac{40}{9} = \frac{8}{9}n \\ \frac{40}{9} \div \frac{8}{9} = \frac{8}{9}n \div \frac{8}{9} \\ \frac{40}{8} = n \\ n = 5 \end{array}$$

16.) $3(x + 12) = 8 - 4x$

$$\begin{array}{r} 3x + 36 = 8 - 4x \\ +4x \quad +4x \\ \hline 7x + 36 = 8 \\ -36 \quad -36 \\ \hline 7x = -28 \\ \frac{7x}{7} = \frac{-28}{7} \\ x = -4 \end{array}$$

26.) Write a ratio of wins to losses for a soccer team that played 27 games and won 19. Simplify the ratio, if possible. Circle your final answer (ratio).

$$\frac{19}{\text{wins}} : \frac{8}{\text{losses}}$$

27.) Write a ratio of kids to adults if there are 94 people at a party, and 57 of them are adults. Simplify the ratio, if possible. Circle your final answer (ratio).

$$\frac{37}{\text{kids}} : \frac{57}{\text{adults}}$$

Solve each word problem that involves percent. Show all work and circle your final answers.

28.) What number is 15% of 80?

$$\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$$

$$\frac{x}{80} = \frac{15}{100}$$

$$\rightarrow 80(15) = 100x$$

$$\begin{array}{r} 80 \\ \times 15 \\ \hline 400 \\ 800 \\ \hline 1200 \end{array}$$

$$\frac{1200}{100} = \frac{100x}{100}$$

$$\boxed{x=12}$$

29.) What percent of 28 is 21?

$$\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$$

$$\frac{21}{28} = \frac{x}{100} \rightarrow \frac{21(100) = 28x}{2100 = 28x}$$

$$\boxed{x=75}$$

30.) 36 is 80% of what number?

$$\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$$

$$\frac{36}{x} = \frac{80}{100}$$

$$\frac{36}{x} = \frac{8}{10}$$

$$\frac{8x}{8} = \frac{360}{8}$$

$$\boxed{x=45}$$

each as much as possible,

$$4 \cdot 7 - (4 - 3)^2 \cdot 6 \div 3$$

$$4 \cdot 7 - (1)^2 \cdot 6 \div 3$$

$$4 \cdot 7 - 1 \cdot 6 \div 3$$

$$28 - 1 \cdot 6 \div 3$$

$$28 - 6 \div 3$$

$$28 - 2 = \boxed{26}$$

$$19.) (3 - 1)^2 + 2 + 7 \cdot 3$$

$$(2)^2 + 2 + 7 \cdot 3$$

$$4 + 2 + 7 \cdot 3$$

$$2 + 7 \cdot 3$$

$$2 + 21$$

$$\boxed{23}$$

$$21.) \text{ Evaluate } -3x + 4 \div 2 \text{ if } x = -2$$

$$-3(-2) + 4 \div 2$$

$$6 + 4 \div 2$$

$$6 + 2$$

$$\boxed{8}$$

Solve each proportion.

$$23.) \frac{2}{n} = \frac{14}{n+30}$$

$$2(n+30) = 14n$$

$$2n + 60 = 14n$$

$$\begin{array}{r} -2n \quad -2n \\ \hline 60 = 12n \end{array}$$

$$\frac{60}{12} = \frac{12n}{12}$$

$$\boxed{5=n}$$

$$24.) \frac{x-4}{10} = \frac{3}{5}$$

$$5(x-4) = 30$$

$$5x - 20 = 30$$

$$\begin{array}{r} +20 \quad +20 \\ \hline 5x = 50 \end{array}$$

$$\frac{5x}{5} = \frac{50}{5}$$

$$\boxed{x=10}$$

$$25.) \frac{x-2}{5} = \frac{x+1}{2}$$

$$2(x-2) = 5(x+1)$$

$$\begin{array}{r} 2x - 4 = 5x + 5 \\ -2x \quad -2x \\ \hline -4 = 3x + 5 \end{array}$$

$$\begin{array}{r} -4 = 3x + 5 \\ -5 \quad -5 \\ \hline -9 = 3x \end{array}$$

$$\frac{-9}{3} = \frac{3x}{3} \quad \boxed{x=-3}$$

$$18.) 2 + 4 \div 2 \cdot 4$$

$$2 + 2 \cdot 4$$

$$2 + 8$$

$$\boxed{10}$$

$$20.) 3 + 3 \div 3 - 3^2$$

$$3 + 3 \div 3 - 9$$

$$3 + 1 - 9$$

$$4 - 9$$

$$= \boxed{-5}$$

$$22.) \text{ Evaluate } \frac{1}{2}(4x + 12) - x \text{ if } x = 3$$

$$\frac{1}{2}(4(3) + 12) - 3$$

$$\frac{1}{2}(12 + 12) - 3$$

$$\frac{1}{2}(24) - 3$$

$$\frac{1}{2} \cdot \frac{24}{1} - 3$$

$$\frac{24}{2} - 3$$

$$12 - 3 = \boxed{9}$$