

Union and Intersection of Sets Bell Work

Find each union or intersection. Let $X = \{2, 4, 8, 16, 32\}$, $Y = \{x | x \text{ is a positive even integer less than } 15\}$, and $Z = \{2, 5, 8, 11, 14, 17\}$.

1. $X \cup Y$

2. $X \cup Z$

3. $Y \cup Z$

4. $X \cap Y$

5. $X \cap Z$

6. $Y \cap Z$

Solve each inequality. Write the solutions as either the union or intersection of two sets.

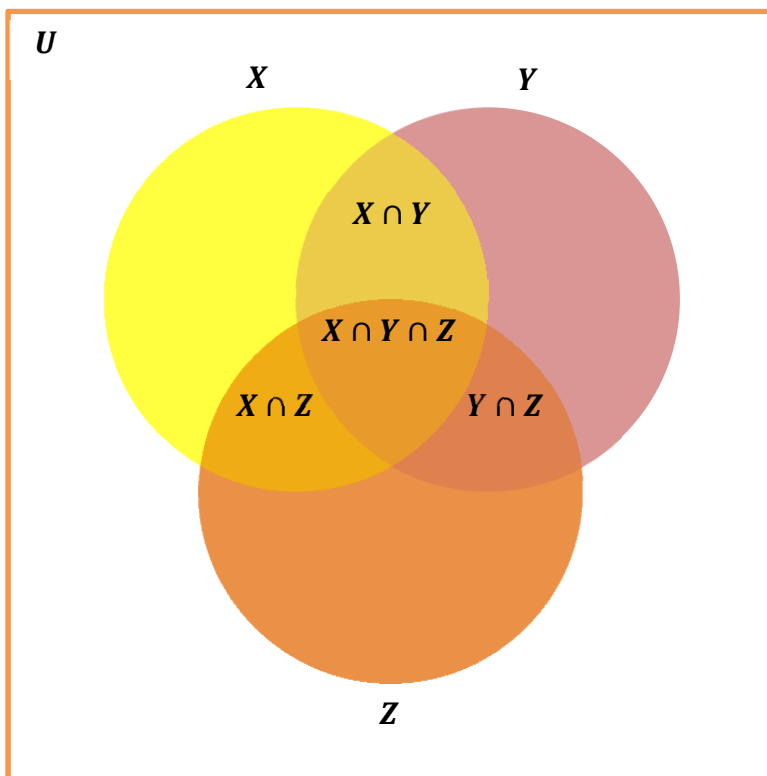
7. $|2x - 6| \geq -18$

8. $2|x - 3| \leq 14$

9. $3(x - 2) < -15x < -3$

Draw a Venn diagram to represent the union and intersection of these sets.

10. Let $X = \{d, o, n, k, e, y\}$, $Y = \{m, o, n, k, e, y\}$ and $Z = \{d, r, a, g, o, n, f, l, y\}$. Draw a Venn diagram to represent the union and intersection of these sets.



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ANSWER

Find each union or intersection. Let $X = \{2, 4, 8, 16, 32\}$, $Y = \{x | x \text{ is a positive even integer less than } 15\}$, and $Z = \{2, 5, 8, 11, 14, 17\}$.

1. $X \cup Y$

$$= \{2, 4, 6, 8, 10, 14, 16, 32\}$$

2. $X \cup Z$

$$= \{2, 4, 5, 8, 11, 14, 16, 17, 32\}$$

3. $Y \cup Z$

$$= \{2, 4, 5, 6, 8, 10, 11, 14, 17\}$$

4. $X \cap Y$

$$= \{2, 4, 8\}$$

5. $X \cap Z$

$$= \{2, 8\}$$

6. $Y \cap Z$

$$= \{2, 8, 14\}$$

Solve each inequality. Write the solutions as either the union or intersection of two sets.

7. $|2x - 6| \geq -18$

$$\{x | x \leq 12\} \cup \{x | x \geq -6\}$$

$$2x - 6 \geq -18$$

$$2x - 6 + 6 \geq -18 + 6$$

$$2x \geq -12$$

$$\frac{2x}{2} \geq \frac{-12}{2}$$

$$x \geq -6$$

$$\{x | x \geq -6\}$$

$$2x - 6 \leq 18$$

$$2x - 6 + 6 \leq 18 + 6$$

$$2x \leq 24$$

$$\frac{2x}{2} \leq \frac{24}{2}$$

$$x \leq 12$$

$$\{x | x \leq 12\}$$

8. $2|x - 3| \leq 14$

$$\frac{2|x - 3|}{2} \leq \frac{14}{2}$$

$$|x - 3| \leq 7$$

$$\{x | x \leq 10\} \cap \{x | x \geq -4\}$$

$$x - 3 \leq 7$$

$$x - 3 + 3 \leq 7 + 3$$

$$x \leq 10$$

$$\{x | x \leq 10\}$$

$$x - 3 \geq -7$$

$$x - 3 + 3 \geq -7 + 3$$

$$x \geq -4$$

$$\{x | x \geq -4\}$$

9. $3(x - 2) < -15x < -3$

$$3(x - 2) < -15x < -3$$

$$3x - 6 < -15x < -3$$

$$\left\{x | x < \frac{1}{3}\right\} \cup \left\{x | x > \frac{1}{5}\right\}$$

$$3x - 6 < -15x$$

$$3x - 3x - 6 < -15x - 3x$$

$$-6 < -18x$$

$$\frac{-6}{-18} > \frac{-18x}{-18}$$

$$\frac{1}{3} > x$$

$$\left\{x | x < \frac{1}{3}\right\}$$

$$-15x < -3$$

$$\frac{-15x}{-15} > \frac{-3}{-15}$$

$$x > \frac{1}{5}$$

$$\left\{x | x > \frac{1}{5}\right\}$$

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Draw a Venn diagram to represent the union and intersection of these sets.

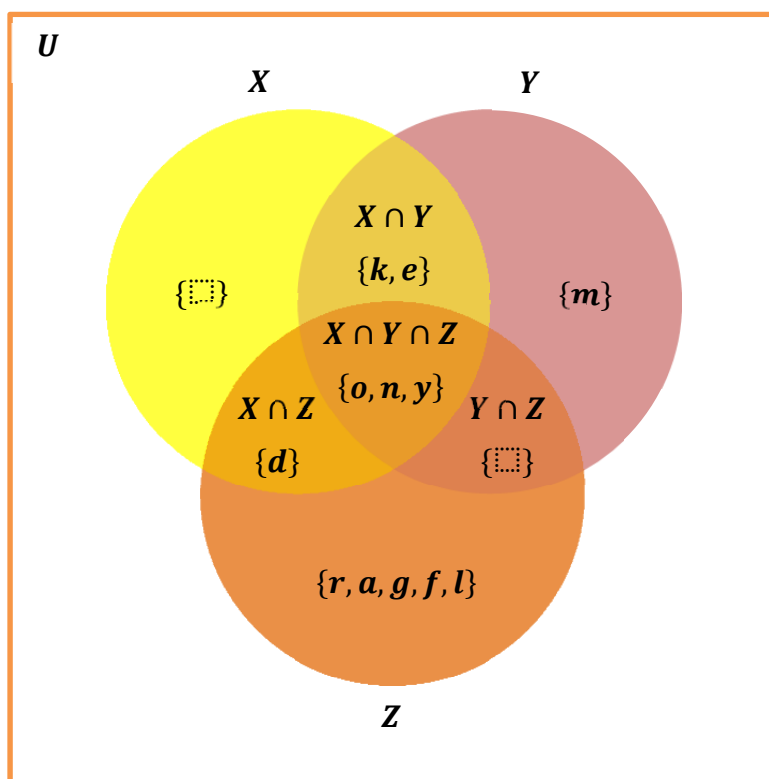
10. Let $X = \{h, o, r, s, e\}$, $Y = \{t, u, r, k, e, y\}$ and $Z = \{m, o, n, k, e, y\}$. Draw a Venn diagram to represent the union and intersection of these sets.

$$X \cap Y = \{o, n, k, e, y\}$$

$$X \cap Z = \{d, o, n, y\}$$

$$Y \cap Z = \{o, n, y\}$$

$$X \cap Y \cap Z = \{o, n, y\}$$



Name: _____ Period: _____ Date: _____

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