

# Union and Intersection of Sets Assignment

Find each union or intersection.

Let  $A = \{2, 4, 6, 8\}$ ,  $B = \{x | x \text{ is a positive even integer less than } 13\} = \{2, 4, 6, 8, 10, 12\}$ ,  $C = \{1, 4, 7, 10, 13\}$ , and  $D = \{x | x \text{ is a prime number less than } 16\} = \{2, 3, 5, 7, 11, 13\}$ .

1.  $A \cup B$

2.  $A \cup C$

3.  $A \cup D$

4.  $B \cup C$

5.  $B \cup D$

6.  $C \cup D$

7.  $A \cap B$

8.  $A \cap C$

9.  $A \cap D$

10.  $B \cap C$

11.  $B \cap D$

12.  $C \cap D$

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

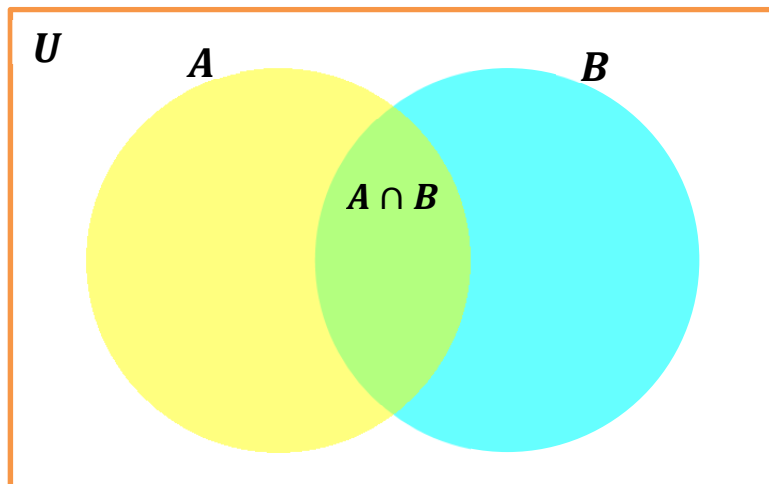
13.  $|x + 7| \leq 11$

14.  $|3x + 8| \geq 17$

15.  $2(5x + 13) - 5.7 < 30.3x < 0$

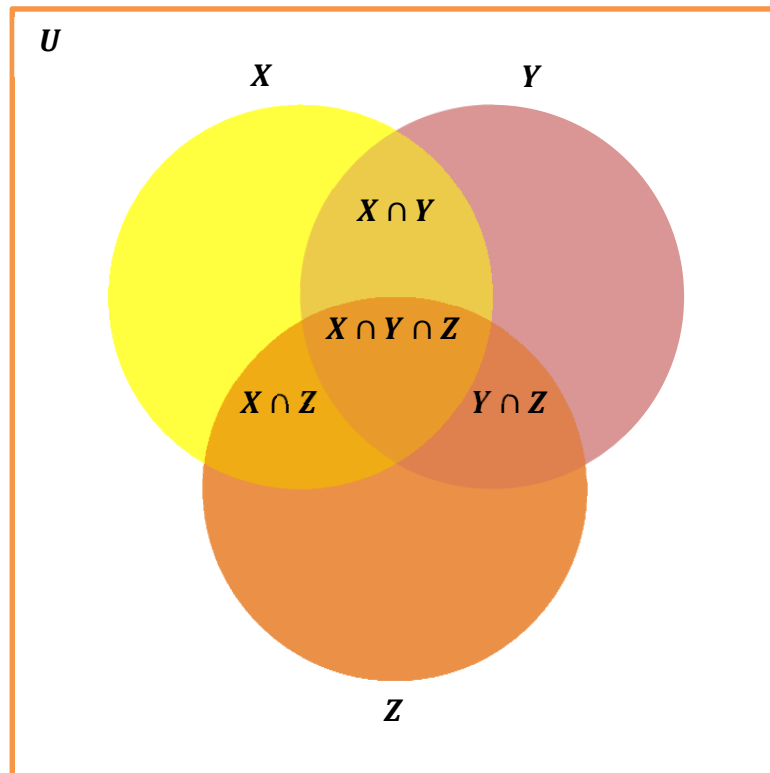
Draw a Venn diagram to represent the union and intersection of these sets.

16. Let  $A = \{2, 7, 12, 17\}$  and  $B = \{x | x \text{ is a positive whole number less than } 8\}$ . Find  $A \cap B$ .



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17. Let  $X = \{8, 9, 11, 13\}$ ,  $Y = \{7, 8, 9, 10\}$  and  $Z = \{-5, 5, 7, 9, 11\}$ . Find  $X \cap Y \cap Z$ .



# Union and Intersection of Sets Assignment

## ANSWER

Find each union or intersection.

Let  $A = \{2, 4, 6, 8\}$ ,  $B = \{x | x \text{ is a positive even integer less than } 13\} = \{2, 4, 6, 8, 10, 12\}$ ,  $C = \{1, 4, 7, 10, 13\}$ , and  $D = \{x | x \text{ is a prime number less than } 16\} = \{2, 3, 5, 7, 11, 13\}$ .

1.  $A \cup B$

$$= \{2, 4, 6, 8, 10, 12\}$$

3.  $A \cup D$

$$= \{2, 3, 4, 5, 6, 7, 8, 11, 13\}$$

5.  $B \cup D$

$$= \{2, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13\}$$

7.  $A \cap B$

$$= \{2, 4, 6, 8\}$$

9.  $A \cap D$

$$= \{2\}$$

11.  $B \cap D$

$$= \{2\}$$

2.  $A \cup C$

$$= \{1, 2, 4, 6, 7, 8, 10, 13\}$$

4.  $B \cup C$

$$= \{1, 2, 4, 6, 7, 8, 10, 12, 13\}$$

6.  $C \cup D$

$$= \{1, 2, 3, 4, 5, 7, 10, 11, 13\}$$

8.  $A \cap C$

$$= \{4\}$$

10.  $B \cap C$

$$= \{4, 10\}$$

12.  $C \cap D$

$$= \{7, 13\}$$

# Union and Intersection of Sets Assignment

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

13.  $|x + 7| \leq 11$

$$\{x|x \leq 4\} \cap \{x|x \geq -18\}$$

$$x + 7 \leq 11$$

$$x + 7 - 7 \leq 11 - 7$$

$$x \leq 4$$

$$\{x|x \leq 4\}$$

$$x + 7 \geq -11$$

$$x + 7 - 7 \geq -11 - 7$$

$$x \geq -18$$

$$\{x|x \geq -18\}$$

14.  $|3x + 8| \geq 17$

$$\left\{x|x \leq -\frac{25}{3}\right\} \cup \{x|x \geq 9\}$$

$$3x + 8 \geq 17$$

$$3x + 8 - 8 \geq 17 - 8$$

$$3x \geq 9$$

$$\frac{3x}{3} \geq \frac{9}{3}$$

$$x \geq 9$$

$$\{x|x \geq 9\}$$

$$3x + 8 \leq -17$$

$$3x + 8 - 8 \leq -17 - 8$$

$$3x \leq -25$$

$$\frac{3x}{3} \leq \frac{-25}{3}$$

$$x \leq -\frac{25}{3}$$

$$\left\{x|x \leq -\frac{25}{3}\right\}$$

15.  $2(5x + 13) - 5.7 < 30.3x < 0$

$$10x + 26 - 5.7 < 30.3x < 0$$

$$10x + 20.3 < 30.3x < 0$$

$$\{x|x < 0\} \cup \{x|x > 1\}$$

$$10x + 20.3 < 30.3x$$

$$10x - 10x + 20.3 < 30.3x - 10x$$

$$20.3 < 20.3x$$

$$\frac{20.3}{20.3} < \frac{20.3x}{20.3}$$

$$1 < x$$

$$\{x|x > 1\}$$

$$30.3x < 0$$

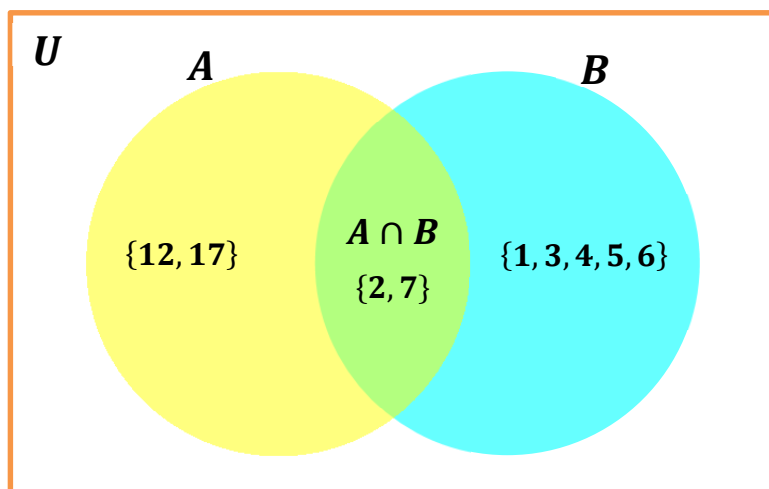
$$\frac{30.3x}{30.3} < \frac{0}{30.3}$$

$$x < 0$$

$$\{x|x < 0\}$$

16. Let  $A = \{2, 7, 12, 17\}$  and  $B = \{x | x \text{ is a positive whole number less than } 8\}$ . Find  $A \cap B$ .

$$A \cap B = \{2, 7\}$$



- $$X \cap Y = \{8, 9\}$$

$$X \cap Z = \{9, 11\}$$

$$Y \cap Z = \{7, 9\}$$

$$X \cap Y \cap Z = \{ \quad \}$$

