

Union and Intersection of Sets Exit Quiz

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

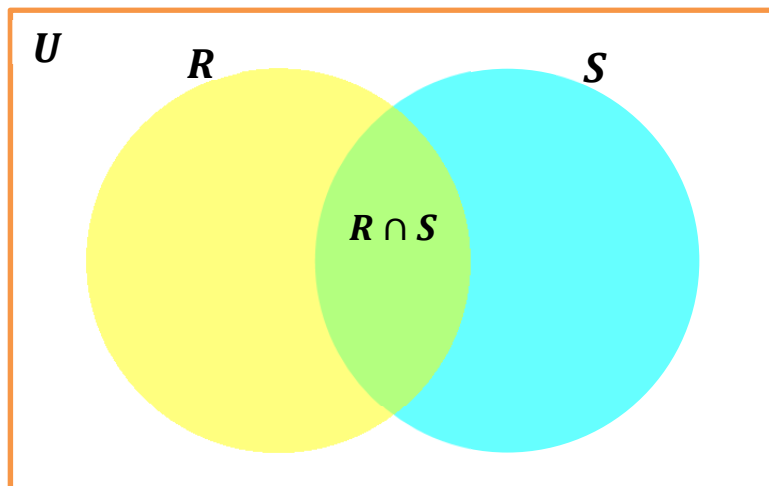
1. $|2x - 6| < 12$

2. $12 > |3x + 15|$

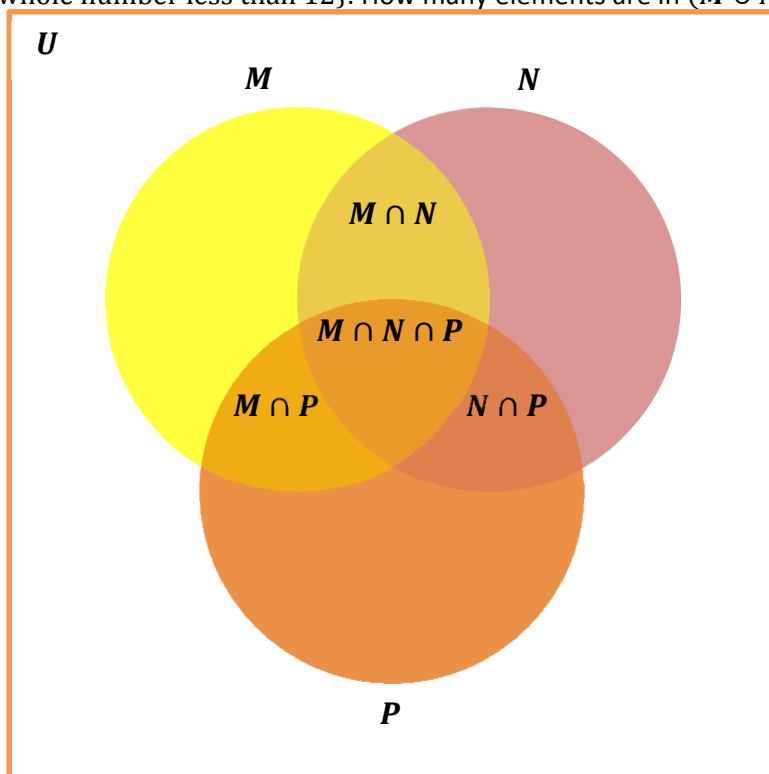
3. $5(x - 10) - 7x \leq -72x \leq -56$

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

4. Let $R = \{2, 3, 4, 5\}$ and $S = \{x | x \text{ is a positive, even integer less than } 9\}$. How many elements are in $R \cup S$?



5. Let $M = \{1, 3, 5, 7\}$, $N = \{x | x \text{ is an odd whole number less than } 6\}$ and $P = \{x | x \text{ is an even whole number less than } 12\}$. How many elements are in $(M \cup N) \cap P$?



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ANSWER

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

1. $|2x - 6| < 12$

$$\{x|x < 9\} \cap \{x|x > -3\}$$

$$2x - 6 < 12$$

$$2x - 6 + 6 < 12 + 6$$

$$2x < 18$$

$$\frac{2x}{2} < \frac{18}{2}$$

$$x < 9$$

$$\{x|x < 9\}$$

$$2x - 6 > -12$$

$$2x - 6 + 6 > -12 + 6$$

$$2x > -6$$

$$\frac{2x}{2} > \frac{-6}{2}$$

$$x > -3$$

$$\{x|x > -3\}$$

2. $12 > |3x + 15|$

$$|3x + 15| < 12$$

$$\{x|x < -1\} \cap \{x|x > -9\}$$

$$3x + 15 < 12$$

$$3x + 15 - 15 < 12 - 15$$

$$3x < -3$$

$$\frac{3x}{3} < \frac{-3}{3}$$

$$x < -1$$

$$\{x|x < -1\}$$

$$3x + 15 > -12$$

$$3x + 15 - 15 > -12 - 15$$

$$3x > -27$$

$$\frac{3x}{3} > \frac{-27}{3}$$

$$x > -9$$

$$\{x|x > -9\}$$

3. $5(x - 10) - 7x \leq -72x \leq -56$

$$5x - 50 - 7x \leq -72x \leq -56$$

$$-2x - 50 \leq -72x \leq -56$$

$$\left\{x \mid x \leq \frac{5}{7}\right\} \cup \left\{x \mid x \geq \frac{7}{9}\right\}$$

$$-2x - 50 \leq -72x$$

$$-2x + 2x - 50 \leq -72x + 2x$$

$$-50 \leq -70x$$

$$\frac{-50}{-70} \geq \frac{-70x}{-70}$$

$$\frac{5}{7} \geq x$$

$$\left\{x \mid x \leq \frac{5}{7}\right\}$$

$$-72x \leq -56$$

$$\frac{-72x}{-72} \geq \frac{-56}{-72}$$

$$x \geq \frac{7}{9}$$

$$\left\{x \mid x \geq \frac{7}{9}\right\}$$

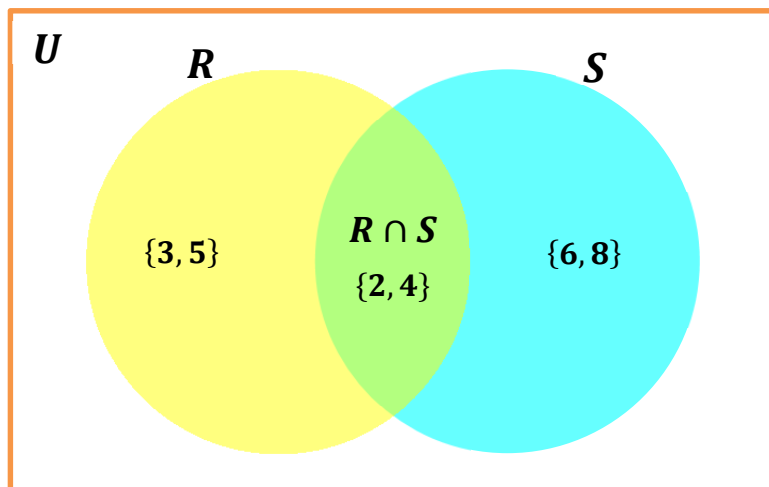
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Draw a Venn diagram to represent the union and intersection of these sets.

4. Let $R = \{2, 3, 4, 5\}$ and $S = \{x|x \text{ is a positive, even integer less than } 9\}$. How many elements are in $R \cup S$?

$$R \cup S = \{2, 3, 4, 5, 6, 8\}$$

$$R \cap S = \{2, 4\}$$



5. Let $M = \{1, 3, 5, 7\}$, $N = \{x|x \text{ is an odd whole number less than } 6\}$ and $P = \{x|x \text{ is an even whole number less than } 12\}$. How many elements are in $(M \cup N) \cap P$?

$$M \cap N = \{1, 3, 5\}$$

$$M \cap P = \{ \}$$

$$N \cap P = \{ \}$$

$$M \cup N = \{1, 3, 5, 7\}$$

$$(M \cup N) \cap P = \{ \}$$

$$M \cap N \cap P = \{ \}$$

with zero element

