Chapter 5
Solving and Graphing Linear Inequalities

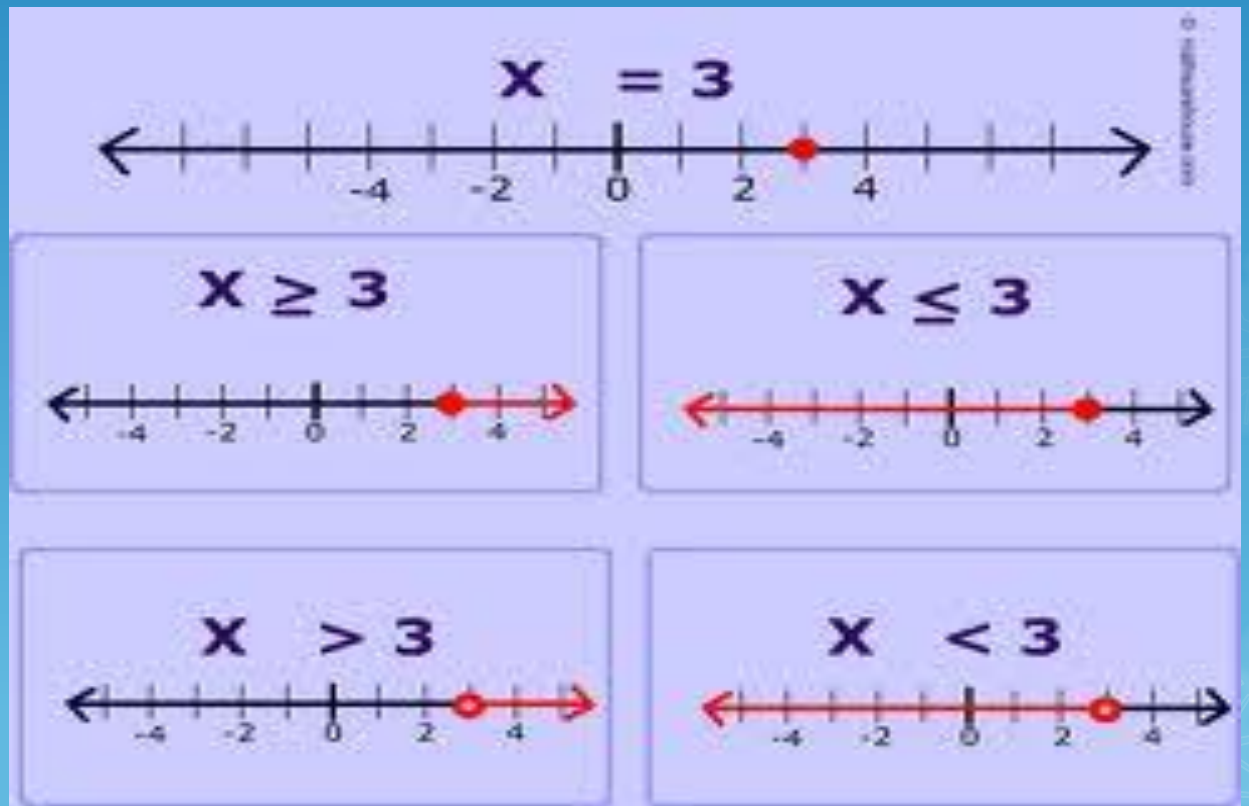
5.1
Solve Inequalities Using Addition and Subtraction

Inequalities

- The _____ of two _____ using:

Graph of an Inequality in One Variable

- The _____that represents _____ _____ of the inequality.
  - Use an _____ for < and >
  - Use a _____ for ≤ and ≥



To Solve Inequalities:

- _____ from each side to get the _____.
- Do _____change the sign.

EX:

Solve the inequality. Graph your solution.

- $X - 9 < 3$

$-1 \geq m + \frac{1}{2}$

- $Y + 14.9 > -2.7$

$-1\frac{1}{3} \leq x - 8\frac{1}{3}$

EX:

- Write and graph an inequality that describes the situation.
- The lowest temperature recorded in Antarctica was -129◦F at the Russian Vostok station in 1983.

- You must 12 or under to order off of the kids menu.

EX:

- You are checking a bag at the airport. Bags can weigh no more than 50 pounds. Your bag weighs 16.8 pounds. Find the possible weights that you can add to the bag by writing and solving an inequality.

5.2
Solve Inequalities Using Multiplication and Division

To Solve Inequalities:

- Multiply or divide each side of the inequality by the _____to get the _____.
- If you multiply or divide by a _____ you must _____ the _____ _____.

EX:

Solve the inequality. Graph your solution.

- $\frac{x}{8} \leq -2$

$5x < 45$

- $\frac{x}{-7} \leq 1.6$

$-6x > 24$

EX:

- A restaurant owner wants to place identical flower bouquets on 35 tables for opening night. The owner wants to spend no more than $400 on the flowers. Write and solve an inequality that shows the possible amounts of money the owner should budget for each bouquet.

5.3
Solve Multi-Step Inequalities

To Solve Inequalities:

- _____ each side.
- Get all of your _____ on the _____ _____ if necessary.
- _____the same thing from each side.
- _____each side by the same thing.

  - REMEMBER TO _____IF YOU _____ BY A _____.

EX:Solve the inequality. Graph your solution.

- $-6y + 5 < -16$

$\frac{-1}{4}(p - 12) > -2$

$4 - 2m > 7 - 3m$

$\frac{-2}{3}d - 2 < \frac{1}{3}d + 8$

If you loose your variable when solving an inequality:

- 1) And the resulting inequality is _____, then the solution is _____.

- 2) And the resulting inequality is _____, then the inequality has _____.

EX: Solve the inequality, if possible.

- $1 - 8s \leq -4(2s - 1)$

$\frac{1}{5}(4m + 10) < \frac{4}{5}m + 2$

$3p - 5 > 2p + p - 7$

$5x - 12 \leq 3x - 4$

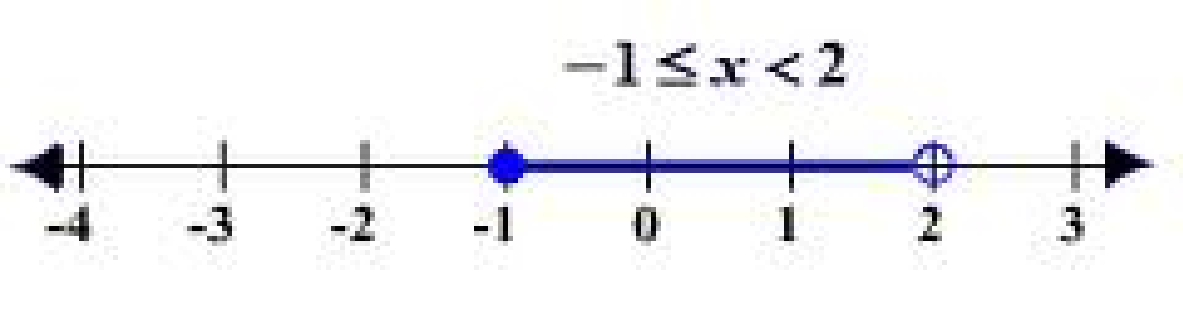
EX:

- You are saving money for a summer basketball camp that costs $1800. You have saved $500 so far, and you have 14 more weeks to save. What are the possible average amounts of money that you can save per week in order to have at least $1800 saved?

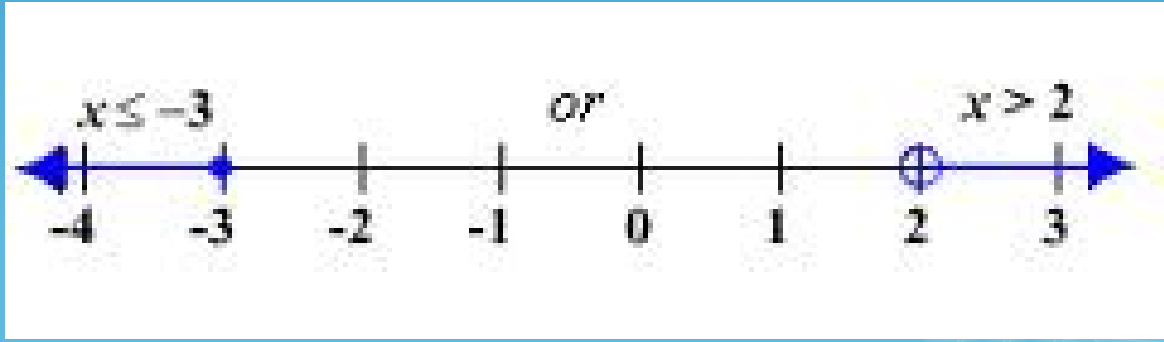
5.4
Solve Compound Inequalities

Compound Inequality

- A **compound inequality** consists of _____ inequalities joined by _____.
- EX: "And" Inequality



- EX: "Or" Inequality



To solve compound inequalities:

- **With AND:**
- Whatever you do to the _____ of the inequality, do to _____of the inequality.

- **With OR:**
- Solve _____ inequality _____.

EX:

Solve the inequality. Graph your solution.

- $10 < 2(y + 2) < 24$ $\qquad$ $-7 \le -x - 1 \le 3$

$4x + 1 < -3$ or $5x - 3 > 17$

$9x - 6 > 12x + 1$ or $4 > \frac{-2}{5}x + 8$

EX: Translate the verbal phrase into an inequality. Then graph the inequality.

- All real numbers that are less than -1 *or* greater than or equal to 4.

- All real numbers that are greater than or equal to -3 *and* less than 5.

- At an auction, the lowest bid for an autographed trading card is $20. The highest bid is $54.

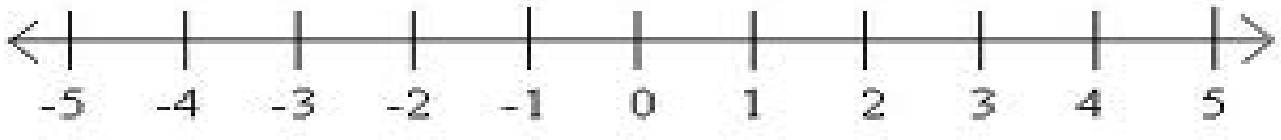
EX:

- Mars has a maximum temperature of 25ºC at the equator and a minimum temperature of -130ºC at the winter pole.
- Write and solve a compound inequality that describes the possible temperatures (in degrees Fahrenheit) on Mars.
- Graph your solution.

5.5
Solve Absolute Value Equations

Absolute Value

- The **absolute value** of a number is the _____ between _____on the number line.
- Symbol:
- The absolute value of a number is _____ because _____.
- EX: | 5 |
- EX: | -5 |



Solving Absolute Value Equations:

- 1) _____the _____.
- 2) Take what is _____ of the absolute value symbol and _____ to both the _____ of what is on the other side of the equation.
- 3) _____ the resulting equations.

EX: Solve the equation.

- $|x| = 8$

$|2x - 7| = 9$

- $4|t + 9| - 5 = 19$

$\frac{1}{3}|2x - 5| + 3 = 7$

No Solution

- Anytime the absolute value expression equals a _____, the equation has _____.
- EX: |2x + 6| = -9

EX:

Solve the equation, if possible.

- $2|x - 5| + 4 = 2$ $-3|x + 2| - 7 = -10$