

SECTION 1.5 SOLVING INEQUALITIES

- 1) Translate to an inequality. Use the variable x for next year's salary.

My salary next year will be at least \$47,000.

Choose the correct inequality.

At least is greater than or equal to

- A. $x \geq \$47,000$
 B. $x > \$47,000$
 C. $x < \$47,000$
 D. $\$47,000 \geq x$

- 2) Solve the inequality. Check your solutions.

$$5t + 2 \leq 12$$

$$\underline{-2}$$

move 2 to the right and change the sign

$$5t \leq 10 \text{ divide by 5}$$

$$t \leq 2$$

- 3) What are the solutions of $6x + 13 > 3x - 2$?

$$\underline{-3x} \quad \underline{-13}$$

$$3x > -15 \quad \text{divide by 3}$$

$$x > -5$$

- 4) Solve the inequality. Check your solutions.

$$5x + 2 \geq 22$$

$$\underline{-2}$$

move 2 to the right and change the sign

$$5x \geq 20 \text{ divide by 5}$$

$$x \geq 4$$

5) Solve the inequality.

$$-12 - 4x \leq 0$$

$$\underline{\quad + 12} \quad \text{move 12 to the right and change the sign}$$

$$-4x \leq 12 \quad \text{divide by -4}$$

$$x \geq -3$$

****change inequality direction when dividing by a negative number

6) Solve the inequality.

$$2(x - 8) + 8x \geq -6$$

Distribute the 2

$$2x - 16 + 8x \geq -6$$

combine like terms on left

$$10x - 16 \geq -6$$

move -8 to the right and change the sign

$$\underline{\quad + 16}$$

$$10x \geq 10 \quad \text{divide by 10}$$

$$x \geq -5$$

7) Solve the inequality.

$$-2(x + 4) + 5x < -17$$

distribute the 2

$$-2x - 8 + 5x < -17$$

combine like terms on left

$$3x - 8 < -17 \quad \text{move -8 to the right and change the sign}$$

$$\underline{\quad + 8}$$

$$3x < -9$$

divide by 3

$$x < -3$$

8) Solve for x.

$$4(x - 1) - 5x \geq -1$$

distribute the 4

$$4x - 4 - 5x \geq -1$$

combine like terms on left

$$-x - 4 \geq -1$$

move -4 to the right and change the sign

$$\underline{\quad + 4}$$

$$-x \geq 3$$

****change inequality direction when dividing by a -1

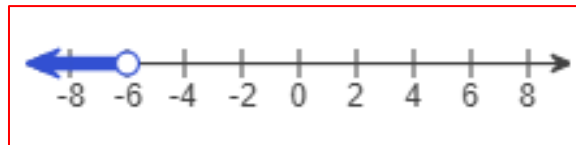
$$x \leq -3$$

- 9) Solve for x.
Graph the solution.

$$3x + 2 < 2x - 4$$

$$\underline{-2x} \quad \underline{-2}$$

$$x < -6$$



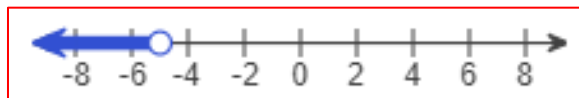
< 0 open circle pointed left

- 10) Solve for x.
Graph the solution.

$$5x + 1 < 4x - 4$$

$$\underline{-4x} \quad \underline{-1}$$

$$x < -5$$



< 0 open circle pointed left

- 11) What are the solutions of $8x + 5 > 6x - 5$?

$$\underline{-6x} \quad \underline{-5}$$

$$2x > -10$$

divide by 2

$$x > -5$$

- 12) Solve the inequality. Check your solutions.

$$3x + 2 \geq 8$$

$$\underline{-2}$$

$$3x \geq 6$$

divide by 3

$$x \geq 2$$

- 13) Solve the inequality.

$$-15 - 5x \leq 0$$

$$\underline{15}$$

$$-5x \leq 15$$

$$x \geq -3$$

****change inequality direction when dividing by a -5

14) Solve the inequality. Check your solution.

$$2 \geq -10 + 3m \quad \text{Move the } 3m \text{ to the left (you want variable on left)}$$

$$\frac{-3m \quad -2}{-3m \geq -12}$$

$$-3m \geq -12$$

$$\downarrow$$
$$m \leq -3$$

****change inequality direction when dividing by a -3

15) Solve the inequality.

$$3(x - 6) + 3x \geq -6$$

$$3x - 18 + 3x \geq -6$$

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

$$\frac{+18}{6x \geq 12}$$

$$6x \geq 12$$

$$x \geq -2$$

distribute the 3

combine like terms on left

move -18 to the right and change the sign

divide by 6

16) Solve the inequality.

$$-2(x + 3) + 9x < -13 \quad \text{distribute the } -2$$

$$-2x - 6 + 9x < -13 \quad \text{combine like terms on left}$$

$$7x - 6 < -13$$

move -6 to the right and change the sign

$$\frac{+6}{7x < -7}$$

$$7x < -7$$

divide by 6

$$x < -1$$

17) Solve the following inequality. Graph the solution.

$$4a - 19 > 13$$

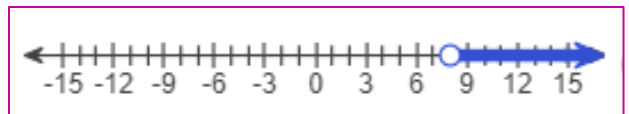
move -19 to the right and change the sign

$$\frac{+19}{4x > 32}$$

$$4x > 32$$

divide by 4

$$a > 8$$



18) Solve the inequality. Graph the solution.

$$6(m - 5) + 5 < 29$$

distribute the 6

$$6m - 30 + 5 < 29$$

combine like terms on left

$$6m - 25 < 29$$

move -25 to the right and change the sign

$$\underline{+25}$$

$$6m < 54$$

divide by 6

$$m < 9$$



19) Solve the following inequality. Graph the solution.

$$9a - 41 > 31$$

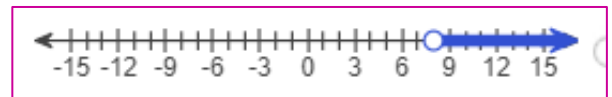
move -41 to the right and change the sign

$$\underline{+41}$$

$$9a > 72$$

divide by 9

$$a > 8$$



20) Solve the inequality. Graph the solution.

$$4(m - 7) + 4 < 12$$

distribute the 4

$$4m - 28 + 4 < 12$$

combine like terms on left

$$4m - 24 < 12$$

move -24 to the right and change the sign

$$\underline{+24}$$

$$4m < 36$$

divide by 4

$$m < 9$$

