5.1-5.3 INEQUALITY WORD PROBLEMS

Define a variable, write an inequality, and solve.

A number increased by 4 is at least 3.

Let x = a number

$$x + 4 \geq 3$$
$$ -4 \quad -4$$
$$\boxed{x \geq -1}$$

Define a variable, write an inequality, and solve.

Three times a number subtracted from 10 is at   least 6 more than the number.

Let x = a number

$$10 - 3x \geq x + 6$$
$$ -x \quad\quad -x$$
$$10 - 4x \geq 6$$
$$-10 -10$$
$$-4x \geq -4$$
$$\overline{-4} \quad\quad \overline{-4}$$
$$\boxed{x \leq 1}$$

Define a variable, write an inequality, and solve.

Four more than 6 times a number is at most 5 times the number decreased by 3.

Let $x = $ a number

$$6x + 4 \leq 5(x - 3)$$
$$6x + 4 \leq 5x - 15$$
$$\underline{-5x \qquad -5x}$$
$$x + 4 \leq \qquad -15$$
$$\underline{-4 \qquad -4}$$
$$\boxed{x \leq -19}$$

Define a variable, write an inequality, and solve.

City Bank requires a minimum balance of $1200 for free checking. If Mr. Ray still has free checking after making withdrawals of $2000 and $1454, how much was in his account before the withdrawals?

Let $x = $ amount in account before withdrawals

$$x - 2000 - 1454 \geq 1200$$
$$x - 3454 \geq 1200$$
$$\underline{+ 3454 \qquad + 3454}$$
$$\boxed{x \geq \$4654}$$

Define a variable, write an inequality, and solve.

The sum of two <u>consecutive odd integers is</u> at   most 123.
Find the pair with the greatest sum.

Let x = 1st cons. odd integer
$x+2$ = 2nd cons. odd integer

$$x + (x + 2) \le 123$$
$$2x + 2 \le 123$$
$$\quad\quad -2 \quad\quad -2$$
$$\frac{2x}{2} \le \frac{121}{2}$$
$$x \le 60.5 \longrightarrow x = \boxed{59}$$
$$x+2 = \boxed{61}$$

Define a variable, write an inequality, and solve.

Jace's scores on the first four of five tests were   85, 89, 90, and 81. What score must he receive on the fifth test to have an average of at least an 87?

Let x = fifth test

$$5 \cdot \frac{85 + 89 + 90 + 81 + x}{5} \ge 87 \cdot 5$$

$$85 + 89 + 90 + 81 + x \ge 435$$
$$345 + x \ge 435$$
$$-345 \quad\quad -345$$
$$\boxed{x \ge 90}$$

Define a variable, write an inequality, and solve.

Mr. Samuels works for a real estate office that   pays its agents 5% of their sales. How much real estate will Mr. Samuels have to sell to earn a minimum of $36,000?

Let x = Mr. Samuels' sales

$$\frac{.05x}{.05} \geq \frac{36,000}{.05}$$

$$\boxed{x \geq \$720,000}$$

Define a variable, write an inequality, and solve.

Find all sets of three consecutive positive even   integers whose sum is less than 30.

Let x = 1st cons. pos. even int.
   x + 2 = 2nd
   x + 4 = 3rd

$$\begin{array}{|c|}\hline 6 \\ 8 \\ 10 \\ \hline \end{array} \quad \begin{array}{|c|}\hline 4 \\ 6 \\ 8 \\ \hline \end{array} \quad \begin{array}{|c|}\hline 2 \\ 4 \\ 6 \\ \hline \end{array}$$

$$x + (x+2) + (x+4) < 30$$

$$3x + 6 < 30$$

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

$$\frac{3x}{3} < \frac{24}{3}$$

$$x < 8$$