

$$9 - n < 12$$

$$5n \geq -10$$

Accelerated Math Notes

(Sections 8-7)

Solving Inequalities by Using

*Addition & Subtraction Properties

*Multiplication & Division Properties

$$n + 4 \leq -5$$

$$-4x > 8$$

When you add or subtract the same number to each side of an inequality, the inequality remains true.

x77 74x

$$n + 5 > 11$$

$$\begin{array}{r} -5 \quad -5 \\ \hline n > 6 \end{array}$$

Choose
 $n = 10$

$$\begin{array}{r} n + 5 > 11 \\ 10 + 5 \quad | \\ \hline 15 > 11 \checkmark \end{array}$$

$$-21 \geq d - 8$$

$$\begin{array}{r} +8 \quad +8 \\ \hline -13 \geq d \end{array}$$

$$\downarrow$$
$$d \leq -13$$

Choose
 $d = -17$

$$\begin{array}{r} -21 \geq d - 8 \\ -17 - 8 \quad | \\ \hline -25 \geq -25 \checkmark \end{array}$$

When you multiply or divide each side of the inequality by the same **POSITIVE** number, the inequality remains true.

$$9x \leq 54$$

$$\frac{9x}{9} \leq \frac{54}{9}$$

$$x \leq 6$$

ck
 $x = 1$

$$\begin{array}{r} 9x \leq 54 \\ 9 \cdot 1 \quad | \\ \hline 9 \leq 54 \checkmark \end{array}$$

$$\frac{n}{4} > 12$$

$$(4) \frac{n}{4} > 12 (4)$$

$$n > 48$$

$n = 52$

$$\begin{array}{r} \frac{n}{4} > 12 \\ \frac{52}{4} \quad | \\ \hline 13 > 12 \checkmark \end{array}$$

When you multiply or divide each side of the inequality by a **NEGATIVE** number, the inequality symbol must be reversed for the inequality to remain true.

$$-9x > -27$$

$$\frac{-9x}{-9} < \frac{-27}{-9}$$

$$x < 3$$

$x = 1$

$$\begin{array}{r} -9x > -27 \\ -9 \cdot 1 \quad | \\ \hline -9 > -27 \checkmark \end{array}$$

$$\frac{x}{5} \geq 15$$

$$(-5) \cdot \frac{x}{5} \leq 15 \cdot (-5)$$

$$x \leq -75$$

$x = -80$

$$\begin{array}{r} \frac{x}{5} \geq 15 \\ \frac{-80}{5} \quad | \\ \hline -16 \geq 15 \checkmark \end{array}$$

Solving Problems involving Inequalities

(Sections 8.6 - 8.7)

Can I get my grade up to an A???

How much extra money beside my allowance do I need to earn to be able to go on the 8th grade trip?

Jose wants to run a 10K marathon. A rule of thumb for training is that you will generally have enough endurance to finish a race that is up to three times your average daily distance. If the length of his current daily runs is 2 kilometers, by how many kilometers should he increase his daily run to have enough endurance for the race?

Let d = the increase in # of miles Jose should run

$3(2 \text{ km} + \text{amount of increase})$ should be \geq desired 10K distance

$$3(2 + d) \geq 10$$

$$\begin{array}{r} 6 + 3d \geq 10 \\ -6 \quad -6 \end{array}$$

$$3d \geq 4$$

$$\frac{3d}{3} \geq \frac{4}{3}$$

$$d \geq \frac{4}{3}$$

$\frac{1}{3}$ km or more

A person weighing 168 pounds has a 7-pound backpack. If three times the weight of your backpack and its contents should be less than your body weight, what is the maximum weight for the contents of the pack?

Let w = weight of contents of backpack

$$3(\text{weight of backpack and contents}) < \boxed{\text{body weight}}$$

$$3(w + 7) < 168$$

$$\begin{array}{r} 3w + 21 < 168 \\ -21 \quad -21 \end{array}$$

$$3w < 147$$

$$\frac{3w}{3} < \frac{147}{3}$$

$$w < 49$$

Six more than twice a number is greater than negative fourteen. Find all numbers that make this statement true.

Let n = the #

$$\begin{array}{r} 2n + 6 > -14 \\ -6 \quad -6 \end{array}$$

$$2n > -20$$

$$\frac{2n}{2} > \frac{-20}{2}$$

$$n > -10$$

Tara's parents are renting the indoor soccer field for her birthday. The facility charges \$14 per person and a \$100 maintenance fee. If her parents want to spend no more than \$500, find the greatest number of friends that can be invited to stay within budget.

Let f = # of friends

$$\boxed{\text{maintenance fee}} + \boxed{\text{charge for all friends}} \leq \$500$$

$$\begin{array}{r} 100 + 14f \leq 500 \\ -100 \quad -100 \end{array}$$

$$14f \leq 400$$

$$\frac{14f}{14} \leq \frac{400}{14}$$

$$f \leq 28.57\dots$$

28 friends

One side of a triangle is four times as long as another side, and the third side is 12 inches long. If the perimeter can be no longer than 87 inches, find the maximum lengths of the other two sides.

$4x$ one side
 x another side
 12 3rd side

$$\text{Perimeter} \leq 87$$

$$4x + x + 12 \leq 87$$

$$\begin{array}{r} 5x + 12 \leq 87 \\ -12 \quad -12 \end{array}$$

$$5x \leq 75$$

$$\frac{5x}{5} \leq \frac{75}{5}$$

$$x \leq 15$$

$$x = 15 \quad 4x = 4 \cdot 15 = 60$$

15 in and 60 in

A real estate agent receives a monthly salary of \$1200 plus a 3.4% commission on every home sold. For what amount of monthly sales will the agent earn at least \$5000?

x = amount of monthly sales

$$\begin{array}{r} 1200 + .034(x) \geq 5000 \\ -1200 \quad -1200 \end{array}$$

$$0.034x \geq 3800$$

$$\frac{0.034x}{.034} \geq \frac{3800}{.034}$$

$$x \geq 111764.7059$$

\$111,764.71

There is one more test (250 points) in the marking period. Andy has an 88% average based on 1500 points. What must he score on the last test to get his average up to an A (A-)?

Let x = # points on last test

$$x + .88(1500) \geq 89.5(1750)$$

$$\begin{array}{r} x + 1320 \geq 1566.25 \\ -1320 \quad -1320 \end{array}$$

$$x \geq 246.25$$

246.25 points

Solve $4 - 3x \leq 2$

$$\begin{array}{r} -4 \qquad -4 \\ \hline -3x \leq -2 \end{array}$$

$$\frac{-3x}{-3} \geq \frac{-2}{-3}$$

$$x \geq \frac{2}{3}$$

$x=1$

Check

$$\begin{array}{r} 4 - 3x \leq 2 \\ \hline 4 - 3 \cdot 1 \\ 4 - 3 \\ 1 \leq 2 \checkmark \end{array}$$

⊙

$$4 - 3x \leq 2$$

$$4 + -3x \leq 2$$



Solve

$$-6 \leq 5 - x$$

$$\begin{array}{r} -6 \leq 5 + -x \\ -5 \quad -5 \end{array}$$

$$-11 \leq -x$$

$$\frac{-11}{-1} \geq \frac{-x}{-1}$$

$$11 \geq x$$

$$x \leq 11$$

ck
 $x=1$

$$\begin{array}{r} -6 \leq 5 - x \\ \hline \quad \quad 5 - 1 \\ -6 \leq 4 \checkmark \end{array}$$