

Notes 5.6 – Solving Equations and Inequalities

Warmup – Solve each equation or inequality

1. $3x + 14 = 35$
 $\quad -14 \quad -14$
 $\frac{3x}{3} = \frac{21}{3}$ $x = 7$

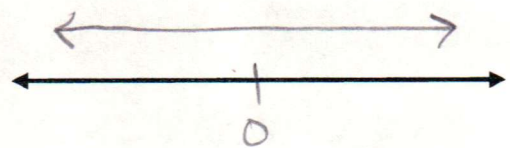
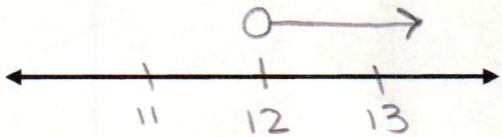
2. $9 - 4(x - 1) = 25$ $-4x = 12$
 $9 - 4x + 4 = 25$ $\frac{-4x}{-4} = \frac{12}{-4}$
 $-4x + 13 = 25$ $x = -3$
 $\quad -13 \quad -13$
 $-4x = 12$

3. $8(x - 5) = 6x - 18$
 $8x - 40 = 6x - 18$ $\frac{2x}{2} = \frac{22}{2}$
 $-4x \quad -6x$
 $2x - 40 = -18$ $x = 11$
 $\quad +40 \quad +40$

4. Solve for y: $2x - 3y = -15$
 $\quad -2x \quad -2x$
 $\frac{-3y}{-3} = \frac{-2x - 15}{-3}$
 $y = \frac{2}{3}x + 5$

5. $\frac{2}{3}x + 7 > 15$
 $\quad -7 \quad -7$
 $(\frac{3}{2}) \frac{2}{3}x > 8(\frac{3}{2})$
 $x > 12$

6. $4x - 15 \leq 4x + 11$
 $\quad -4x \quad -4x$
 $-15 \leq 11$ true



Lesson – Context Problems

* Pay attention to whether you are writing an equation or an inequality.

a) The membership fee for the rec center is \$24 per year. Each class is \$3 to attend. You calculated that you spent \$96 last year at the rec center. How many classes did you take?

Write and solve an equation that models the situation.

$c = \text{classes}$ $3c + 24 = 96$ $c = 24$
 $\quad \quad \quad -24 \quad -24$
 $\frac{3c}{3} = \frac{72}{3}$

Write a sentence using context.

Interpret your solution.

You took 24 classes last year at the rec center.

- b) Your family is driving 1500 miles away for vacation. Your mom said that it will take 42 hours to get there. If your average speed will be 50 miles per hour, how many hours will there be when you do not have to be in the car driving (resting, eating, etc.)?

Write and solve an equation that models the situation.

$$h = \text{hours}$$

$$\frac{1500}{50} + h = 42$$

$$\begin{array}{r} 30 + h = 42 \\ -30 \quad -30 \end{array}$$

$$h = 12$$

Interpret your solution.

You will have 12 hours where you will not be driving on the road trip.

- c) You are moving and need to rent a truck. The truck costs \$20 per hour to rent and you can rent a hand truck for a flat fee of \$5. You can spend up to \$125, how many hours can you rent the truck for?

Write and solve an inequality that models the situation.

$$h = \text{hours}$$

$$\begin{array}{r} 20h + 5 \leq 125 \\ -5 \quad -5 \end{array}$$

$$h \leq 6$$

$$\frac{20h}{20} \leq \frac{120}{20}$$

Interpret your solution.

You can rent the truck for up to 6 hours.

Write your solution in interval notation.

$$[0, 6]$$

Making sense of Expressions

Symbol	Meaning	Units
M	Miles ran in PE on Monday	miles
W	Miles ran in PE on Wednesday	miles
F	Miles ran in PE on Friday	miles
S	Miles from home to school	miles
H	Time (hours) spent traveling to or from school	hours
T_M	Time (minutes) running in PE on Monday	min.
T_W	Time (minutes) running in PE on Wednesday	min
T_F	Time (minutes) running in PE on Friday	min

Based on the meaning of each variable, describe what each expression is finding.

d) $M + W + F$

total miles you ran
in PE on Monday,
Wednesday, & Friday

e) $4(M + W + F)$

total miles you ran in
PE for 4 weeks (month)

f) $2S$

The distance you
travel in one day
to & from school

g) $T_M + T_W + T_F$

total time you ran in
PE on Monday, Wed.
& Friday

h) $\frac{T_M + T_W + T_F}{3}$

Average time spent
running per day
in PE

i) $5(2H)$

total time spent
traveling to & from
School in one week

j) $M + H$

no relationship,
this is meaningless