

## 2.1 Writing Equations

is = equal  
product  $\times$   
dividend, quotient  $\div$   
sum  $+$   
difference  $-$

is as much as =  
is the same as =

CD p. 75 Ex 1

Guided Practice

} Words  $\rightarrow$  Equation

p. 76 Ex 2 & Ex 3

p. 77 Ex 4

} equation to words

Ex 5

CD p. 77 1-8 WB

CW p. 78 11-18, 21-23 WB

HW. Words SP4P

1-16 1-11

## 2.2 Solving Equations

One step

4 types  $+$ ,  $-$ ,  $\times$ ,  $\div$

Ex.  $x+2=4$     $x-2=8$     $2x=6$     $(3)x=8(3)$

$$\begin{array}{r} x+2=4 \\ -2 \quad -2 \\ \hline x=2 \end{array}$$
$$\begin{array}{r} x-2=8 \\ +2 \quad +2 \\ \hline x=10 \end{array}$$
$$\begin{array}{r} 2x=6 \\ \frac{2}{2} \quad \frac{6}{2} \\ \hline x=3 \end{array}$$
$$\begin{array}{r} (3)x=8(3) \\ \frac{3}{3} \quad \frac{8(3)}{3} \\ \hline x=24 \end{array}$$

Check answers

$$\begin{array}{r} 2+2=4 \\ 4=4 \checkmark \end{array}$$
$$\begin{array}{r} 10-2=8 \\ 8=8 \checkmark \end{array}$$
$$\begin{array}{r} 2(3)=6 \\ 6=6 \checkmark \end{array}$$
$$\begin{array}{r} 24=8 \\ \frac{24}{3} \quad \frac{8}{3} \\ \hline 8=8 \checkmark \end{array}$$

We don't use algebra tiles!

CD p. 86, H10 all!

Day 2

CW: Wkst 2.2 P. 1-22

CW 8-36

Hw: Wkst 2.2 SP 1-30

Hw 1 step eq

5-6

2 steps!

### 2.3 Multi Step Equations

4 types

Do + & - 1st!

Ex

$$\begin{array}{r} 2x+4=8 \\ -4-4 \\ \hline \end{array}$$

$$\frac{2x=4}{2 \quad 2}$$

$$x=2$$

$$\begin{array}{r} 2x-6=12 \\ +6+6 \\ \hline \end{array}$$

$$\frac{2x=18}{2 \quad 2}$$

$$x=9$$

$$\begin{array}{r} x+2=4 \\ -2-2 \\ \hline \end{array}$$

$$\textcircled{3} \frac{x}{3} = 2 \textcircled{3}$$

$$x=6$$

$$\begin{array}{r} x-6=8 \\ +6+6 \\ \hline \end{array}$$

$$\textcircled{2} \frac{x}{2} = 14 \textcircled{2}$$

$$x=28$$

Check

$$2(2)+4=8$$

$$4+4=8$$

$$8=8 \checkmark$$

$$2(9)-6=12$$

$$18-6=12$$

$$12=12 \checkmark$$

$$\frac{6}{3}+2=4$$

$$2+2=4$$

$$4=4 \checkmark$$

$$28/2-6=8$$

$$14-6=8$$

$$8=8 \checkmark$$

Also:

$$\textcircled{3} \frac{2x}{3} = 12 \textcircled{3}$$

$$\frac{2x=36}{2 \quad 2}$$

$$x=18$$

check

$$\frac{2(18)}{3} = 12$$

$$\frac{36}{3} = 12$$

$$12=12 \checkmark$$

$$\frac{k+9}{12} = -2$$

$$k+9=-24$$

$$-9-9$$

$$k=-33$$

check

CD p. 93 1-6 all

Cwp. 94, 11-22 all

Hw: 2 step wkshd.

$$\frac{-33+9}{12} = -2$$

$$\frac{-24}{12} = -2$$

$$-2=-2 \checkmark$$

## 2.3 Day 2

Consecutive integers 1, 2, 3, 4, 5, ...  
 $n = 1^{\text{st}}$                        $n+2 = 3^{\text{rd}}$   
 $n+1 = 2^{\text{nd}}$

Consecutive odd integers 1, 3, 5, 7, 9, ...  
 $n = 1^{\text{st}}$                        $n+4 = 3^{\text{rd}}$   
 $n+2 = 2^{\text{nd}}$

Consecutive even integers 2, 4, 6, 8, 10, ...  
 $n = 1^{\text{st}}$                        $n+4 = 3^{\text{rd}}$   
 $n+2 = 2^{\text{nd}}$

Ex. Find 3 consecutive odd integers  
with a sum of 57.

① Name them

$n = 1^{\text{st}}$  cons. odd      (17)  
 $n+2 = 2^{\text{nd}}$  cons. odd      (19)  
 $n+4 = 3^{\text{rd}}$  cons. odd      (21)

② Write equation  $\rightarrow$  sum means +  
 $n + n+2 + n+4 = 57$

$$3n + 6 = 57$$

$$\frac{3n}{3} = \frac{51}{3}$$

$$n = 17$$

③ Put back into original "naming"

④ Check that they are odd or even  
4 consecutive!

⑤ Check answer

## 2.4 Multi Step - variable both sides

$$\text{Ex } 2x - 4 = x + 8$$

$$-x \quad -x$$

$$x - 4 = 8$$

$$+4 \quad +4$$

$$x = 12$$

① Move smallest x

② 1 or 2 step equation

③ Solve

④ Check

Check

$$2(12) - 4 = 12 + 8$$

$$24 - 4 = 20$$

$$20 = 20 \checkmark$$

$$\text{Ex. } 3w + 2 = 7w$$

$$-3w \quad -3w$$

$$\frac{2}{4} = \frac{4w}{4}$$

$$w = 2/4 = 1/2 \quad \text{always reduce!}$$

What if

$$7w + 2 = 3w$$

$$-3w \quad -3w$$

$$4w + 2 = 0$$

$$-2 \quad -2$$

$$\frac{4w}{4} = \frac{-2}{4}$$

$$w = -2/4 = -1/2$$

Don't lose a!

$$\text{What if } 2x + 4 = 2x + 8$$

$$4 \neq 8 \quad \emptyset$$

$$2x + 4 = 2x + 4$$

R

$$\frac{x-2}{6} = \frac{x}{8}$$

$$8(x-2) = 6x$$

$$8x - 16 = 6x$$

$$\begin{array}{r} -6x \\ \hline \end{array} \quad \begin{array}{r} -6x \\ \hline \end{array}$$

$$2x - 16 = 0$$

$$\begin{array}{r} +16 +16 \\ \hline \end{array}$$

$$\frac{2x}{2} = \frac{16}{2} \quad x = 8$$

C/D p.100, 1-9 odd

CW p.100, 11-21 odd

HW p.100, 10-20 even

Day 2

CD p.100 2-8 even

CW multistep w/alt

HW SPAP

## 2.5 Solving Equations with Absolute Value



$$|7| = 7$$

$$-|7| = -7$$

$$|-7| = 7$$

$$-|-7| = -7$$

Ex)  $|a-7| + 15$      $a = 5$

$$|5-7| + 15$$

$$|-2| + 15$$

$$2 + 15 = 17$$

Ex)  $23 - |3 - 4x|$ ,  $x = 2$

$$23 - |3 - 4(2)|$$

Do more of these!

$$23 - |3 - 8|$$

$$23 - |-5| = 23 - 5 = 18$$

$$|x| = 8$$

$$x = 8$$

$$x = -8$$

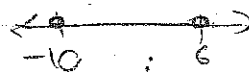
$$|x+2| = 8$$

$$x+2 = 8$$

$$x+2 = -8$$

$$\begin{array}{r} -2 \quad -2 \\ \hline x = 6 \end{array}$$

$$\begin{array}{r} -2 \quad -2 \\ \hline x = -10 \end{array}$$



Check  $|6+2| = 8$

$$|8| = 8$$

$$8 = 8$$

$|-10+2| = 8$

$$|-8| = 8$$

$$8 = 8$$

2.5 Day 2

$$|x|=7 \quad x = \pm 7$$

$$|x-2|=7$$

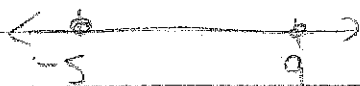
$$x-2=7$$

$$x=9$$

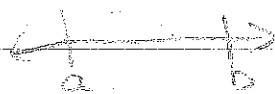
$$x-2=-7$$

$$x=-5$$

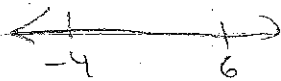
Graph



But what if we start with a graph



1) Find distance  
 $|b-a|$



$$6 - (-4) = 10$$

2) divide distance in 1/2

$$10/2 = 5$$

3) Find mid

$$\frac{a+b}{2}$$

$$\frac{-4+6}{2} = \frac{2}{2} = 1$$

$$|x - \text{mid}| = \text{distance}/2$$

$$|x-1| = 5$$

$$x-1=5$$

$$x=6$$

$$x-1=-5$$

$$x=-4$$





$$27 - n = 10$$
$$10 / 2 = 5$$

$$\frac{17 + 27}{2} = 22$$

$$|x - 22| = 5$$

$$\begin{array}{r} x - 22 = 5 \\ 22 \quad 22 \\ \hline x = 27 \end{array} \quad \begin{array}{r} x - 22 = -5 \\ +22 \quad +22 \\ \hline x = 17 \end{array}$$

CD p. 105, 11, 12.

p. 106, 33-36

HW 2.5, SP

HW 2.5 P

## 2.6 Ratios & Proportions

$$\frac{a}{b} = \frac{\text{ratio}}{\text{fraction}}$$

a:b a to b

$$\frac{a}{b} = \frac{c}{d} \text{ Proportion}$$

to be a true proportion  $ad = bc$

$$\frac{2}{4} = \frac{4}{8} \quad 16 = 16 \checkmark$$

$$\frac{2}{3} = \frac{6}{12} \quad 18 \neq 24 \text{ not}$$

$$\text{Ex. } \frac{6}{10} = \frac{2}{5} \text{ NO}$$

$$\text{Ex. } \frac{1}{6} = \frac{5}{30} \text{ YES}$$

TO solve a proportion

Ex)

$$\frac{x}{8} = \frac{25}{40}$$

$$\frac{40x}{40} = \frac{200}{40}$$

$$x = 5$$

Ex)

$$\frac{x+4}{5} = \frac{3}{8}$$

$$8(x+4) = 15$$

$$8x+32 = 15$$

$$\frac{-32}{8} \quad \frac{-32}{8}$$

$$\frac{8x = -17}{8} \quad x = \frac{-17}{8} = -2.13$$

## 2.7 Percent of Change

$$\text{Percent of Change} = \frac{\text{increase or decrease}}{\text{Original}} = \frac{P}{100}$$

P = Percent

Room

Original 24 sq ft

Now 40 sq ft.

$$40 - 24 = 16 \text{ Increase}$$

$$\frac{\text{Increase}}{\text{Original}} = \frac{P}{100}$$

$$\frac{16}{24} = \frac{P}{100}$$

$$P = 66.7\% \text{ Increase}$$

Car

Original 20,000

now 15,000

$$20,000 - 15,000 = 5,000$$

decrease

$$\frac{\text{decrease}}{\text{Original}} = \frac{P}{100}$$

$$\frac{5,000}{20,000} = \frac{P}{100}$$

$$P = 25\% \text{ decrease}$$

Shirt

originally \$20

now its

25% off

how much does it cost now?

$$\frac{x}{20} = \frac{25}{100}$$

$$100x = 500$$

$$x = \$5 \text{ off}$$

20 originally

- 5 off

\$15 now

5.73

- 5.73  
(17.21)

## 2.8 Literal Equations + Dimensional Analysis

$$A = LW$$

$$\frac{2x}{2} = \frac{4}{2}$$

$$x = 2$$

$$\frac{x \cdot y}{x} = \frac{2}{x}$$

$$y = \frac{2}{x}$$

$$D = m \cdot v$$

$$v \cdot D = \frac{m \cdot v}{v}$$

$$m = vD$$

$$D = \frac{m}{v}$$

$$v \cdot D = \frac{m \cdot v}{v}$$

$$\rightarrow \frac{vD}{D} = \frac{m}{D}$$

$$v = \frac{m}{D}$$

EX)  $3n + 6p = 15$

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

$$\frac{3n}{3} = \frac{-6p + 15}{3}$$

$$n = \frac{-6p + 15}{3} = \frac{-6p}{3} + \frac{15}{3}$$

$$= -2p + 5$$

EX)  $\frac{k-2}{5} = 11$

$$k-2 = 5(11)$$

$$k-2 = 55$$

$$\underline{+2 \quad +2}$$

$$k = 55 + 2$$