

Homework Qs

Note Title

2/2/2016

2.3 # 57

$$x + (x+3)(-3) = x-3$$

could rewrite as
 $x - 3(x+3) = x-3$

$$x - 3x - 9 = x-3$$

$$\underset{-x}{-2x} - 9 = \underset{-x}{x} - 3$$

$$\underset{+9}{-3x} - 9 = \underset{+9}{-3}$$

$$-3x = 6$$

$$\frac{-3x}{-3} = \frac{6}{-3}$$

$$x = -2$$

$\{-2\}$

2.3 # 69

$$0.08x + 0.09(x+2000) = 860$$

$$0.08x + 0.09x + 180 = 860$$

$$0.17x = 680$$

$$\frac{0.17x}{0.17} = \frac{680}{0.17}$$

$$x = \frac{680}{0.17} \left(\frac{100}{100} \right)$$

$$x = \frac{68000}{17}$$

$$x = 4000$$

$\{4000\}$

$$\begin{array}{r} 2000 \\ .09 \\ \hline \end{array}$$

$$18 \ 000$$

$$\begin{array}{r} 860 \\ -180 \\ \hline 680 \end{array}$$

$$\begin{array}{r} 4000 \\ 17 \overline{) 68000} \\ \underline{68} \\ 0 \end{array}$$

$$\begin{array}{r} 2 \\ 17 \overline{) 68} \\ \underline{34} \\ 34 \end{array}$$

OR

$$0.08x + 0.09(x + 2000) = 860$$

multiply both
sides by 100:

$$8x + 9(x + 2000) = 86000$$

$$8x + 9x + 18000 = 86000$$

$$17x = 68000$$

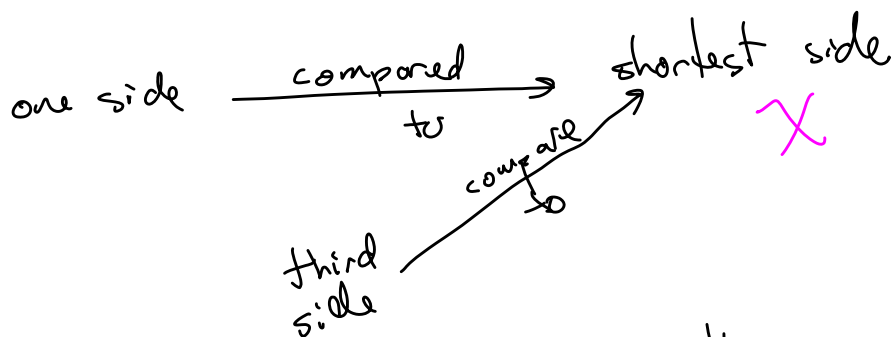
$$x = 4000$$

$$\begin{array}{r} 86 \\ - 18 \\ \hline 68 \end{array}$$

2.5: Word problems (Applications) cont'd:

Example: One side of a triangle is 6 meters more than twice the shortest side. The third side is 9 m more than the shortest side. The perimeter is 75 meters. Find all the sides.

one side: $2x + 6$
shortest side: x
third side: $x + 9$



Perimeter = sum of side lengths

$$75 = (2x + 6) + x + (x + 9)$$

$$2x + 6 + x + x + 9 = 75$$

$$4x + 15 = 75$$

$$4x = 60$$

$$\frac{4x}{4} = \frac{60}{4}$$

$$x = 15$$

next
page

Previous example cont'd:

shortest side: $x = 15$

one side: $2x + 6$

$$x = 15 \Rightarrow 2(15) + 6 = 36$$

third side: $x + 9$

$$x = 15 \Rightarrow 15 + 9 = 24$$

The sides are
15 m, 36 m and
24 m.

Example: Tim is 5 years older than Joanne.
Six years from now, the sum of their ages will
be 79. How old are they now?

	Age now	Age in 6 years
Tim	$x + 5$	$(x + 5) + 6 = x + 11$
Joanne	x	$x + 6$

$$x + 11 + x + 6 = 79$$

$$2x + 17 = 79$$

$$2x = 62$$

$$\frac{2x}{2} = \frac{62}{2}$$

$$x = 31$$

Tim's age now: $x + 5$

$$x = 31 \Rightarrow 31 + 5 = 36$$

next page

Joanne's age now
Tim is 36 now and
Joanne is 31.

check it

Check the answers:

Tim is 5 years older than Joanne? Yes ✓

6 years from now, Tim will be 42 and Joanne will be 37.

Sum:

$$\begin{array}{r} 42 \\ + 37 \\ \hline 79 \end{array} \checkmark$$

Example: Mary has \$3.00 in nickels, dimes, and quarters. She has twice as many dimes as quarters, and five more nickels than dimes. How many coins of each type does she have?

number of nickels: $2x+5$

number of dimes: $2x$

number of quarters: x

Diagram illustrating the relationship between the number of coins:

of nickels $\xrightarrow{\text{compare to}}$ # of dimes $\xrightarrow{\text{compare to}}$ # of qtrs

(Note: The original image has a pink 'X' over the last arrow, indicating a comparison between nickels and quarters.)

$$\underbrace{\$0.05(2x+5)}_{\text{total value of nickels}} + \underbrace{\$0.10(2x)}_{\text{total value of dimes}} + \underbrace{\$0.25x}_{\text{total value of qtrs}} = \$3.00$$

See next page

Previous example cont'd.

$$\cancel{\$} 0.05(2x+5) + \cancel{\$} 0.10(2x) + \cancel{\$} 0.25x = \cancel{\$} 3.00$$

multiply both side by 100:

$$5(2x+5) + 10(2x) + 25x = 300$$

$$10x + 25 + 20x + 25x = 300$$

$$25 + 55x = 300$$

$$55x = 275$$

$$x = \frac{275}{55}$$

$$55 \overline{) 275}$$

$$x = 5$$

$$\begin{array}{r} 2 \\ 55 \\ \underline{5} \\ 275 \end{array}$$

of qtrs: $x = 5$

of dimes: $2x = 2(5) = 10$

of nickels: $2x+5$

$$\begin{aligned} x = 5 &\Rightarrow 2(5) + 5 \\ &= 10 + 5 = 15 \end{aligned}$$

She has 5 quarters, 10 dimes, and 15 nickels.

2.6: More word problems

Example: Find four consecutive integers whose sum is 74.

1st integer: x

2nd integer: $x+1$

3rd integer: $x+2$

4th integer: $x+3$

$$\begin{array}{r} 17 \\ 4 \overline{) 68} \\ \underline{4} \\ 28 \\ \underline{28} \\ 0 \end{array}$$

$$x + (x+1) + (x+2) + (x+3) = 74$$

$$x + x+1 + x+2 + x+3 = 74$$

$$4x + 6 = 74$$

-6 -6

$$4x = 68$$

$$x = 17$$

1st integer: $x=17$.

2nd integer: $x+1$

$$x=17 \Rightarrow 17+1 = 18$$

3rd: $x+2$

$$x=17 \Rightarrow 17+2 = 19$$

$$4^{\text{th}}: x+3 \\ = 17+3 = 20$$

The integers are
17, 18, 19, 20.

Check: Are they consecutive?

$$\text{Sum: } 17+18+19+20$$

$$= 35+39 = 74 \checkmark$$

Note:

Consecutive even integers:

$$x, x+2, x+4, x+6, x+8, \dots$$

Consecutive odd integers:

$$x, x+2, x+4, x+6, \dots$$