7.2-7.4
CLASSIC
WORD PROBLEMS

Example 1
Tony is 4 years older than his brother. Six years ago, he was twice as old as his brother. How old are each now?

$T-6=2(b-6)$

$T=b+4$

$b+4-6=2(b-6)$

$b-2=2b-12$

$b=2b-10$

$-2b \quad -2b$

$-b=-10$

$b=10$

Tony = 14
Brother = 10

Example 2
The length of a rectangle is 4 cm longer than 3 times the width. If the perimeter of the rectangle is 48 cm, find the dimensions.

$L=3w+4$

$48=2w+2L$

$L=3(5)+4$

$L=15+4$

$L=19$

$48=2w+2(3w+4)$

$48=2w+6w+8$

$48=8w+8$

$-8 \qquad -8$

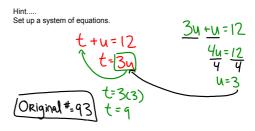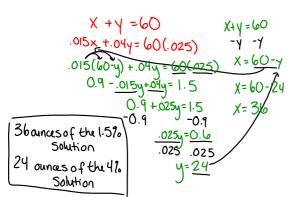$\dfrac{40}{8}=\dfrac{8w}{8}$

$5=w$

Width = 5 cm
Length = 19 cm

Example 4
The sum of the digits of a 2-digit number is 12. The tens digit is 3 times the units (ones) digit. Find the original number.

Hint.....
Set up a system of equations.

$t+u=12$

$t=3u$

$t=3(3)$

$t=9$

Original # = 93

$3u+u=12$

$\dfrac{4u}{4}=\dfrac{12}{4}$

$u=3$

⭐ Example 5 ⭐
A 1.5% acid solution is mixed with a 4% acid solution. How many ounces of each solution are needed to obtain 60 ounces of a 2.5% acid solution?

$x+y=60$

$.015x+.04y=60(.025)$

$.015(60-y)+.04y=60(.025)$

$0.9-.015y+.04y=1.5$

$0.9+.025y=1.5$

$-0.9 \qquad -0.9$

$\dfrac{.025y}{.025}=\dfrac{0.6}{.025}$

$y=24$

$x+y=60$

$-y \quad -y$

$x=60-y$

$x=60-24$

$x=36$

36 ounces of the 1.5% Solution
24 ounces of the 4% Solution

Example 6
On a typical day with light winds, the 1800 mile flight from Charlotte, NC to Phoenix, AZ takes longer than the return trip because the plane has to fly into the wind.

a) The flight from Charlotte to Phoenix is 4 hours and 30 minutes long, the flight from Phoenix to Charlotte is 4 hours long. Find the average speed of the airplane on the way to Phoenix and on the return trip to Charlotte.

b) Use your answer from a to write and solve a system of equations to find the speed of the plane with no wind and the speed of the wind.

$C \rightarrow P \quad 4.5 \quad \dfrac{1800}{4.5}=400mph$

$P \rightarrow C \quad 4 \quad \dfrac{1800}{4}=450mph$

Plane → 425 m/h
Wind → -25 m/h

$P+w=400$

$+ \; P-w=450$

$\dfrac{2p=850}{2} \qquad \dfrac{850}{2}$

$P=425$