

**Math 107**  
**Spring 2017**  
**Lecture 5**

Translate only:

4 times the difference of  $-5$  and Some number  
is equal to 10 less than twice the number.

$$4(-5 - x) = 2x - 10$$

**4.5%** of **what number** **is** **900**?

By Translation

$$\frac{4.5}{100} \cdot x = 900$$

$$0.045x = 900$$

$$x = \frac{900}{.045}$$

$$x = 20000$$

4.5% of 20,000 is 900.

By Proportion

$$\frac{P}{100} = \frac{\text{Part}}{\text{Whole}}$$

Whole comes after of"  
"Part comes after is"

$$\frac{4.5}{100} = \frac{900}{x}$$

$$4.5x = 100(900)$$

$$x = \frac{100(900)}{4.5} \quad \boxed{x=20000}$$

A 6-ft tall person has a shadow of 20ft. A tall building has a shadow of 72 ft. use proportion to find the height of the building.

$$\frac{6 \text{ ft tall}}{20 \text{ ft shadow}} = \frac{x \text{ ft tall}}{72 \text{ ft shadow}}$$

The building is 21.6 ft tall.

$$\frac{6}{20} = \frac{x}{72}$$

Cross-Multiply

$$20x = 6 \cdot 72$$

$$x = \frac{6(72)}{20} = 21.6$$

Eddie made \$150 for 2.5 hrs of work.  
At this rate, how long does he have to work  
to make \$400?

$$\frac{\$150}{2.5 \text{ hrs}} = \frac{\$400}{x \text{ hrs}}$$

→ Cross-Multiply

$$150x = 2.5(400)$$

$$x = \frac{2.5(400)}{150}$$

$$x = 6.\bar{6}$$

About 7 hrs

PTA at a local School purchased a  
total of 60 tickets.  
the # of kids ticket was 3 times the # of  
adult's ticket. How many of each?

$$\text{Total} = 60$$

Parts: Kids →  $3x$

Adults →  $x$

$$\boxed{\text{Kids}} + \boxed{\text{Adults}} = \text{Total}$$

$$\boxed{3x} + \boxed{x} = 60$$

$$4x = 60$$

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

$$\boxed{x = 15}$$

15 adults  
&  
45 kids

Lisa recently got married. Total  $\rightarrow 27$

She ordered 27 photos.

Large & Small Size only.

the # of Small prints was 1 fewer than

3 times the # of large prints. How many of each?

$$\boxed{\text{Small}} + \boxed{\text{Large}} = \text{Total} \rightarrow 4x = 28$$

$$\underline{3x-1} + \underline{x} = 27$$

$$4x - 1 = 27$$

$$4x = 27 + 1$$

Parts:

Small  $\rightarrow 3x - 1$

Large  $\rightarrow x$

$$x = \frac{28}{4} \quad x = 7$$

7 Large & 20 Small photos.

John has 49 coins. Dimes, Nickels, and Quarters.

Total = 49

Dimes, Nickels, Quarters

The # of Quarters were twice the # of dimes.

The # of nickels were 1 more than 3 times the # of dimes.

How many of each does he have? How much money does he have?

Dimes  $\rightarrow x$

Quarters  $\rightarrow 2x$

Nickels  $\rightarrow 3x + 1$

Dimes + Quarters + Nickels = 49

$$x + 2x + 3x + 1 = 49$$

$$6x + 1 = 49$$

$$6x = 49 - 1$$

$$6x = 48$$

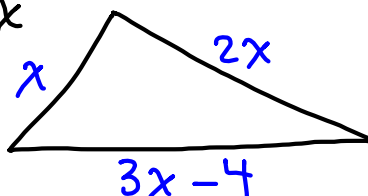
$$x = \frac{48}{6}$$

$$x = 8$$

8 Dimes,  
16 Quarters,  
25 Nickels

$$8(10¢) + 16(25¢) + 25(5¢) \\ = 605¢ = \$6.05$$

Find  $x$



Perimeter is 26 inches.

Total is 26

Parts are Sides

$$\underbrace{\text{Side 1}}_x + \underbrace{\text{Side 2}}_{2x} + \underbrace{\text{Side 3}}_{3x-4} = 26$$

$$x + 2x + 3x - 4 = 26$$

$$6x - 4 = 26$$

$$6x = 30$$

$$\boxed{x = 5}$$

Find all 3 sides  
5 inches, 10 inches, and  
11 inches.

Two sides of a triangle are equal.

The third side is 6 cm shorter than  
the sum of equal sides.

The perimeter is 24 cm.

Find all 3 sides:

$$P = 24$$

$$a + b + c = 24$$

$$x + 2x - 6 + x = 24$$

$$4x - 6 = 24$$

$$4x = 30$$

$$x = \frac{30}{4}$$

$$x = 7.5$$

7.5 cm, 7.5 cm, and 9 cm.

