For a **complete job**:

rate × time = 1

EXAMPLE::

Jose can excavate 50 m^3 of earth in 5 hours

$$r_{Jose} = \frac{50\ m^3}{5\ hrs} = 10\ m^3/hr$$

Six man can transport 600 sacks of rice in 5 hours

$$r_{man} = \frac{600\ m^3}{(5\ hrs)(6\ men)} = 20\ sacks/hr$$

Person A can do the job in 8 hours (Let W=1)

$$r_A = \frac{1}{8\ hrs} = \frac{1}{8}$$

Person B can do laundry in 3 hours (Let W=1)

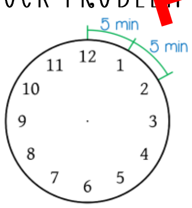
$$r_B = \frac{1}{3\ hrs} = \frac{1}{3}$$

AGE PROBLEM

- one of the most common problems in algebra
- can be solved using **time tables**

PAST	PRESENT	FUTURE
n years ago n years from the past	"now"	m years hence in m years m years afterward
x - n	x	x + m

CLOCK PROBLEM



~Hour hand: x / 12
~Minute hand: x
~Second hand: 60x

Formula Solution

$$\Theta = \frac{11}{2}M - 30H$$

1 rev = 360° = 60 min
∴ 1 min = 6°

where:

- Θ = angle between the minute and hour hands
- -POSITIVE, minute hand is ahead the hour hand;
- -NEGATIVE, minute hand is behind the hour hand
- M = minute count
- H = hour count

MIXTURE PROBLEM

- The easiest way to solve a mixture problem is to draw a rectangle or square which illustrate the content of the mixture

x%	±	y%	=	z%
A		B		A ± B

General Equation:

$$A(x) \pm B(y) = (A \pm B)(z)$$

MOTION/VELOCITY PROBLEM

- In Algebra, the problems pertaining to motion deals only with **uniform velocity** (no acceleration or deceleration in the process).

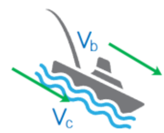
Basic Formula:

$$v = \frac{s}{t} \qquad s = v \times t \qquad t = \frac{s}{v}$$

where: v = velocity, s = distance, t = time

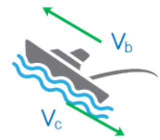
a. ***Boat and Current Problem***

Downstream



$V = V_b + V_c$

Upstream

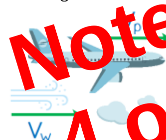


$V = V_b - V_c$

where: V = effective vel. V_b = vel. of the boat V_c = vel. of the current

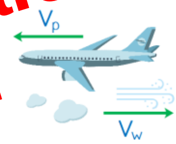
b. ***Plane and Wind Problem***

Travelling with the wind



$V = V_p + V_w$

Travelling against the wind

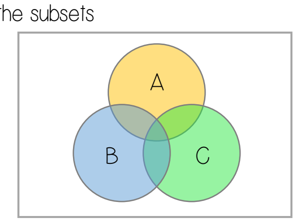


$V = V_p - V_w$

where: V = effective vel. V_p = vel. of the plane V_w = vel. of the wind

VENN DIAGRAM

- is a rectangle (the universal set) that includes circles depicting the subsets



Shortcut Formula (Let W=1):

$$TOTAL = \sum N_0 + \sum N_1 - \sum N_2 + \sum N_3 - \sum N_4 + \ldots$$

EXAMPLE::

In a certain group of consumers, each one may drink beer, and/or brandy, and/or whisky, or all. Also, 155 drink brandy, 173 drink beer, 153 drink whisky, 53 drink beer and brandy, 79 drink beer and whisky, 66 drink brandy and whisky, 21 of them drink beer, brandy, and whisky. How many are there in the group?

TOTAL = 0 + 481 – 198 + 21 = 304 consumers