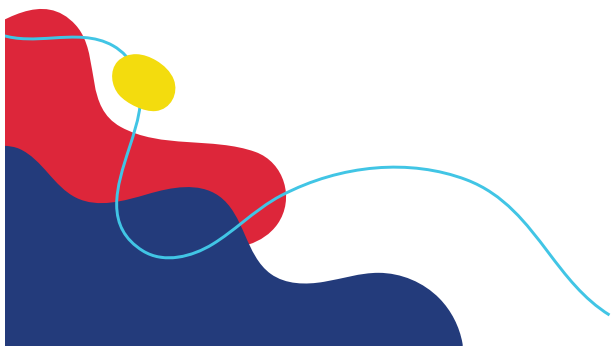
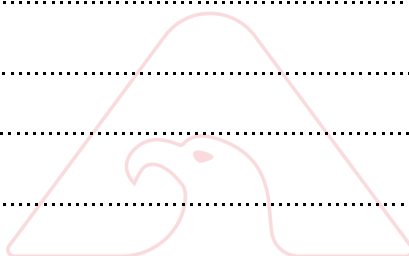




# Solving equations of first degree in one Variable



## \* Sets:

\* Natural =  $\{1, 2, 3, 4, \dots\}$

\* Whole =  $\{0, 1, 2, \dots\}$

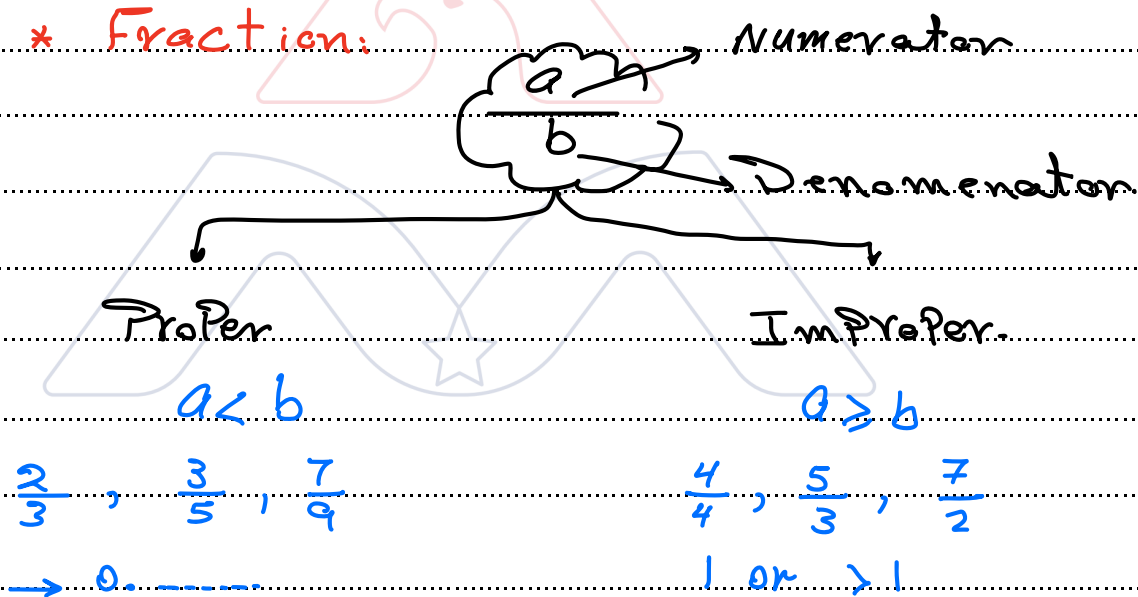
\* Integers =  $\{\dots, -2, -1, 0, 1, 2, 3, \dots\}$

\* Rational =  $\{\frac{a}{b}, b \neq 0\}$

\* Irrational =  $\{\sqrt{2}, \sqrt{3}, \pi, e, \dots\}$

\* Real =  $\{ \text{Rational} \cup \text{Irrational} \}$

## \* Fraction:



\* Ex:  $\rightarrow$  If  $0 < \frac{5}{x} < 1$

which of the following could be  $x$ ?

Proper fraction

A) 4

B) 5

C) 2

✓ D) 7

$$5 < x$$

\* Adding / Subtracting:

$$* \frac{a}{b} \pm \frac{c}{b} = \frac{a \pm c}{b}$$

Ex:

$$\frac{5}{7} + \frac{3}{7} = \frac{8}{7}$$

$$\frac{9}{4} - \frac{3}{4} = \frac{6 \div 2}{4 \div 2} = \frac{3}{2}$$

$$* \frac{a}{b} \pm \frac{c}{d} = \frac{ad \pm bc}{bd}$$

Ex:  $\frac{5}{3} - \frac{7}{2} = \frac{10 - 21}{6} = \frac{-11}{6}$

$$\frac{11}{4} - \frac{3}{2} = \frac{22 - 12}{8} = \frac{10}{8} = \frac{5}{4}$$

or  $\rightarrow \frac{11}{4} - \frac{3 \times 2}{2 \times 2}$

$$\frac{11}{4} - \frac{6}{4} = \frac{5}{4}$$

MultiPly:

$$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$$

Ex:  $\rightarrow \frac{5}{2} \times \frac{7}{3} = \frac{35}{6}$

Ex:  $\frac{\overset{7}{\cancel{49}}}{\underset{5}{\cancel{25}}} \times \frac{\overset{2}{\cancel{4}} \overset{2}{\cancel{20}}}{\underset{3}{\cancel{42}} \underset{6}{\cancel{6}}} = \frac{14}{15}$

\* Divide:

$$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc}$$

Ex:  $\frac{3}{2} \div \frac{5}{7} = \frac{3}{2} \times \frac{7}{5} = \frac{21}{10}$

$$\frac{4}{7}$$

$$\frac{3}{5}$$

$$\frac{4}{7} \div \frac{3}{5}$$

$$= \frac{4}{7} \times \frac{5}{3} = \frac{20}{21}$$

Note: There is another method to Solve.

## \* Solving equations:

If  $x + 2 = 5$

Then  $x = 5 - 2 = 3$

+, -

x, ÷

If  $x - 1 = -7$

Then  $x = -7 + 1 = -6$

If  $2x = 10$

Then  $x = \frac{10}{2} = 5$

If  $\frac{x}{3} = 5$

Then  $x = 5(3) = 15$

If  $2x - 1 = 7$  then  $x = ?$

$2x = 7 + 1$

$2x = 8 \quad (\div 2)$

$x = \frac{8}{2} = 4$

If  $5(3x - 2) = 7$  then find  $x$ ?

$$15x - 10 = 7$$

$$15x = 7 + 10$$

$$15x = 17$$

$$x = \frac{17}{15}$$

If  $3x - 7 = 5$  then find  $2x - 1$ ?

$$3x = 5 + 7$$

$$3x = 12 \quad (\div 3)$$

$$x = \frac{12}{3} = 4$$

$$\rightarrow 2(4) - 1 = 8 - 1 = 7$$

If  $5x - 7 = 3x + 1$  then find  $x$ ?

$$5x - 3x = 1 + 7$$

$$2x = 8 \quad (\div 2)$$

$$x = 4$$

If  $4x - 2 = 12$  then find  $2x - 1$ ?

①  $4x = 12 + 2$

$$4x = 14$$

$$x = \frac{14}{4} = \frac{7}{2}$$

Then  $\rightarrow \cancel{2}(\frac{7}{\cancel{2}}) - 1 = 7 - 1 = 6$

②  $4x = 12 + 2$

$$4x = 14 \quad \div (2)$$

$$2x = 7$$

Then  $2x - 1 = 7 - 1 = 6$

③  $4x - 2 = 12 \quad (\div 2)$

$$2x - 1 = 6$$

→ If  $5x - 3y = 4$  then  
 $10x - 6y = ??$

$$5x - 3y = 4 \quad (\times 2)$$

$$10x - 6y = 8$$

→ If  $\frac{1}{2}y - \frac{1}{3}x = 5$  then

$$2x - 3y = ??$$

→  $\frac{1}{2}y - \frac{1}{3}x = 5 \quad (\times -6)$

$$2x - 3y = -30$$