AM ACADEMY

Solving equations of first degree in one Variable

* Sets:

* natural = $\{1, 2, 3, 4, \ldots\}$
* whole = $\{0, 1, 2, \ldots\}$
* Integers = $\{\ldots, -2, -1, 0, 1, 2, 3, \ldots\}$
* Rational = $\{\frac{a}{b}, b \neq 0\}$
* Irrational = $\{\sqrt{2}, \sqrt{3}, \pi, e, \ldots\}$
* Reel = $\{$ Rational $\cup$ Irrational $\}$

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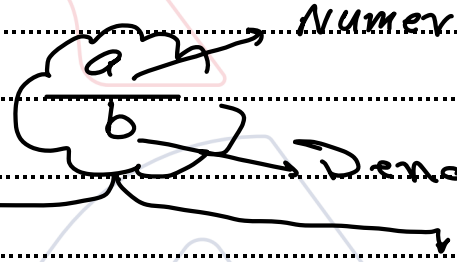
* Fraction:



Proper	Improper
$a < b$	$a \geq b$
$\frac{2}{3}, \frac{3}{5}, \frac{7}{9}$	$\frac{4}{4}, \frac{5}{3}, \frac{7}{2}$
$\rightarrow 0.\_\_\_\_$	1 or > 1

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Ex: → If $0 < \frac{5}{x} < 1$

which of the following could be x?

Proper fraction

A) 4

B) 5 $\quad 5 < x$

C) 2

✓ D) 7

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* 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: $\frac{5}{3} \overset{\times}{\underset{\times}{\diagdown\diagup}} \frac{7}{2} = \frac{10-21}{6} = \frac{-11}{6}$

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

OR → $\frac{11}{4} - \frac{3 \times 2}{2 \times 2}$

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

Multiply:

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

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

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Ex: $\frac{\cancel{49}^{7}}{\cancel{25}_{5}} \times \frac{\cancel{20}^{2}}{\cancel{42}_{3}} = \frac{14}{15}$

* Divide:

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

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

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

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

note: There is another method to Solve.

* Solving equations:

+ , −
× , ÷

If $x + 2 = 5$

Then $x = 5 - 2 = 3$

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 $\rightarrow 2\left(\frac{7}{2}\right)-1 = 7-1 = 6$

(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

$10x - 6y = ??$

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

$10x - 6y = 8$

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

$2x - 3y = ??$

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

$2x - 3y = -30$
