

Deisy Gonzales

Math 2311

1/22/19

Solving Linear Equations

ex 1) $3x - 5 = 4$
 $\quad \quad \quad \underline{+5} \quad \underline{+5}$

$$\frac{3x}{3} = \frac{9}{3}$$

$$\boxed{x = 3}$$

• always leave the variable on the left side
• solve by doing the opposite operation.

ex 2) $2x(-5)(4+3x) = 7x + 9$

$$\underline{2x} - 20 - \underline{15x} = 7x + 9$$

$$\begin{array}{r} -13x - 20 = 7x + 9 \\ \quad \quad \quad +20 \quad \quad \quad \underline{+20} \end{array}$$

$$\begin{array}{r} -13x = 7x + 29 \\ \underline{-7x} \quad \underline{-7x} \end{array}$$

$$\begin{array}{r} -20x = 29 \\ \underline{-20} \quad \underline{-20} \end{array}$$

$$\boxed{x = \frac{-29}{20}}$$

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$$\text{ex 3) } \frac{2x}{5} + \frac{1}{3} = \frac{x-2}{15}$$

$$\frac{2x}{5} + \frac{1}{3} = \frac{x-2}{15}$$

$\begin{matrix} \wedge & & \wedge & & \wedge \\ 1 \cdot 5 & & 1 \cdot 3 & & 3 \cdot 5 \end{matrix}$

#3 appears at most once.

#5 appears at most once.

$$\text{Common denominator} = 3 \cdot 5 = 15$$

$$\left(\frac{3 \cdot 5}{1} \left(\frac{2x}{5} + \frac{1}{3} = \frac{x-2}{15} \right) \right)$$

$$3 \cdot 2x + 5 = x - 2$$

$$\begin{array}{r} 6x + 5 = x - 2 \\ \underline{-x} \quad \quad -x \end{array}$$

$$5x + 5 = -2$$

$$5x = -7$$

$$\boxed{x = -7/5}$$

How to Find Common Denominator.

1) find the factors of all denominators.

2) Write down the most amount of each number appears.

3) multiply everything by the C.D.

Solving Rational Equations

$$\text{ex 1) } \frac{2x-3}{x+1} = \frac{5}{1}$$

\uparrow \uparrow
 $x+1 \cdot 1$ $1 \cdot 1$

$$\text{CD} = (x+1) \cdot 1 \cdot 1 = (x+1)$$

$$(x+1) \left(\frac{2x-3}{x+1} = 5 \right)$$

$$2x-3 = 5(x+1)$$

$$\frac{2x-3}{-5x} = \frac{5x+5}{-5x}$$

$$\frac{-3x-3}{+3} = \frac{5}{+3}$$

$$\frac{-3x}{-3} = \frac{8}{-3}$$

$$\boxed{x = -8/3}$$

✓ this is a good solution

- 1.) Find C.D.
- 2.) Multiply by C.D.
- 3.) Check the restrictions

Restriction

$$x+1=0$$

$$x \neq -1$$

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$$\text{ex2) } \frac{-2}{3y+6} + 2 = \frac{2}{y+2}$$

$\wedge \qquad \qquad \qquad \wedge$
 $3 \cdot y+2 \qquad \qquad \qquad 1 \cdot y+2$

1) Find C.D.

2) Multiply by C.D.

$$\text{C.D.} = 3 \cdot y+2 \cdot 1 = 3 \cdot y+2 = 3y+6$$

$$\frac{3(y+2)}{1} \left(\frac{-2}{3y+6} + 2 = \frac{2}{y+2} \right)$$

$$-2 + 2 \cdot 3(y+2) = 2 \cdot 3$$

$$-2 + 6(y+2) = 6$$

$$\underline{-2} + 6y + \underline{12} = 6$$

$$6y + 10 = 6$$

$$6y = \frac{-4}{6}$$

$$y = -\frac{4}{6} = \boxed{-\frac{2}{3}}$$

✓

good solution

Restriction

$$3y+6 \neq 0$$

$$3y \neq -6$$

$$y \neq -2$$

$$y \neq -2$$