

② Detailed Example = Rational Equation with answer that is rational (fraction) form

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

STEP 1: FACTOR ALL DENOMINATORS and FORM L.C.D., (AS FAR AS POSSIBLE)

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

STEP 2: MULTIPLY BOTH SIDES OF EQUATION (ALL TERMS) MENTALLY

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

STEP 3: SIMPLIFY & SOLVE

$$\begin{aligned} 2 - 10x + 15 &= -5x + 5 \\ 17 - 10x &= -5x + 5 \\ 17 - 5 &= 10x - 5x \\ 12 &= 5x \\ \frac{12}{5} &= x \end{aligned}$$

STEP 4: CHECK

It is OK to convert answers to decimal and check, Two decimal places for five.

Use original equation

so $\frac{2}{2(2.4)^2 - 5(2.4) + 3} - \frac{5}{2.4 - 1} \stackrel{?}{=} \frac{-5}{2(2.4) - 3}$

$$\frac{2}{11.52 - 12 + 3} - \frac{5}{1.4} \stackrel{?}{=} \frac{-5}{4.8 - 3}$$

11.52
-12.00
-0.48

$$\frac{2}{2.52} - 3.57 \stackrel{?}{=} \frac{-5}{1.8}$$

$$\begin{aligned} 0.79 - 3.57 &= -2.78 \\ -2.78 &= -2.78 \checkmark \end{aligned}$$

③ EASY CASE EXAMPLE:

(You can "cross multiply" when you have an equation like $\frac{A}{B} = \frac{C}{D} \Rightarrow AD = BC$ etc)

Solve $\frac{2x-4}{2x+1} = \frac{2}{x}$

The LCD is $x(2x+1)$

$$\begin{aligned} x(2x-4) &= 2(2x+1) \\ 2x^2 - 4x &= 4x + 2 \\ 2x^2 - 8x - 2 &= 0 \\ 2(x^2 - 4x - 1) &= 0 \\ x^2 - 4x - 1 &= 0 \end{aligned}$$

$$\begin{aligned} \text{So } x^2 - 4x &= 1 \\ x^2 - 4x + 4 &= 5 \\ (x-2)^2 &= 5 \\ x-2 &= \pm\sqrt{5} \\ \boxed{x = 2 \pm \sqrt{5}} \end{aligned}$$

Completing the square

$$\begin{aligned} x \approx 4.24 \text{ or } -0.24 \\ \frac{2(4.24) - 4}{2(4.24 + 1)} \approx 0.47 \end{aligned} \left. \begin{array}{l} \text{checking} \\ \text{the} \\ \text{positive} \\ \text{solution} \end{array} \right\}$$

$$\frac{2}{4.24} \approx 0.47$$