

Solving Rational Equations

Steps:

- ① Find the common denominator for the fractions in the equation
- ② Multiply each term by the common denominator to cancel out each bottom
- ③ Distribute the left overs and combine like terms
- ④ Solve for x .
- ⑤ Check answers, throw away any answers that make a denominator = 0.

ex)

$$\frac{3}{x+1} = \frac{6}{10}$$

$$\text{C.D.} = 10(x+1)$$

$$\cancel{10(x+1)} \cdot \frac{3}{\cancel{(x+1)}} = \frac{6}{\cancel{10}} \cancel{10(x+1)}$$

$$10 \cdot 3 = 6(x+1)$$

$$\begin{array}{r} 30 \\ -6 \\ \hline \end{array} = \begin{array}{r} 6x+6 \\ -6 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ -6 \\ \hline \end{array} = \begin{array}{r} 6x \\ -6 \\ \hline \end{array}$$

$$\boxed{4 = x}$$



$$\text{ex) } t \cdot t + \frac{t \cdot 12}{t} - t \cdot 8 = 0 \cdot t$$

$$\text{C.D.} = t$$

$$t^2 + 12 - 8t = 0$$

$$t^2 - 8t + 12 = 0$$

$$\begin{aligned} a &= 1 \\ b &= -8 \\ c &= 12 \end{aligned}$$

$$\frac{8 \pm \sqrt{(-8)^2 - 4(1)(12)}}{2(1)} = \frac{8 \pm \sqrt{64 - 48}}{2}$$

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Power = 2 \rightarrow Quad.
Formula
or
Factor.

$$= \frac{8 \pm \sqrt{16}}{2} = \frac{8 \pm 4}{2}$$

$$x = 6, 2$$

$$\frac{x}{x-1} + x = \frac{4x-3}{x-1}$$

$$\text{C.D.} = x-1$$

$$\cancel{(x-1)} \frac{x}{\cancel{(x-1)}} + (x-1)x = \cancel{(x-1)} \frac{4x-3}{\cancel{x-1}}$$

$$\begin{aligned} a &= 1 \\ b &= -4 \\ c &= 3 \end{aligned}$$

$$x + (x-1)x = 4x-3$$

$$\cancel{x} + x^2 - \cancel{x} = 4x - 3$$

$$x^2 - 4x + 3 = 0$$

$$x^2 - 4x + 3 = 0$$
$$x = 3, \cancel{x}$$

$$x = 3$$

1 makes $x-1=0$
so we throw it
out.

$$\frac{4 \pm \sqrt{(-4)^2 - 4(1)(3)}}{2(1)}$$
$$\frac{4 \pm \sqrt{16-12}}{2} = \frac{4 \pm \sqrt{4}}{2}$$
$$\frac{4 \pm 2}{2}$$

$$\frac{1}{n-2} = \frac{2n+1}{n^2+2n-8} + \frac{2}{n+4}$$

C.D.: $(n-2)(n+4)$

$$\frac{\cancel{(n-2)(n+4)} \cdot 1}{\cancel{n-2}} = \frac{2n+1 \cdot \cancel{(n-2)(n+4)}}{\cancel{(n-2)(n+4)}} + \frac{2 \cdot \cancel{(n-2)(n+4)}}{\cancel{n+4}}$$

$$n+4 = 2n+1 + 2(n-2)$$

$$n+4 = 2n+1 + 2n-4$$

$$n+4 = 4n-3$$

$$\frac{2}{3} = 5$$

$$\frac{12}{x^2-16} - \frac{24}{x-4} = 3$$

$$(x+4)(x-4)$$

$$\cancel{(x+4)}\cancel{(x-4)} \frac{12}{\cancel{(x+4)}\cancel{(x-4)}} - \frac{24}{\cancel{(x-4)}} \cancel{(x+4)} = 3(x+4)\cancel{(x-4)}$$

510! 11-14, 23-27 ALL

