Section 8.5 - Solving Rational Equations:

ex: $\frac{x+2}{4} = \frac{x-4}{6}$ (Proportion but no variables in denom.)

$6(x+2) = 4(x-4)$ Cross multiply.

$6x+12 = 4x-16$ Distribute.

$2x = -28$ Solve.

$x = -14$

ex: $\frac{5}{2x-2} = \frac{15}{x^2-1}$ $x \neq 1, -1$ extraneous roots.

$2(x-1) \quad (x-1)(x+1)$

↳ Rational EQ have a variable in the denominator!!

* must check for ext. roots - undefined values - set den. = 0.

$5(x^2-1) = 15(2x-2)$

$5x^2-5 = 30x-30$

$5x^2-30x+25 = 0$

$5(x^2-6x+5) = 0$

$5(x-5)(x-1) = 0$

$x = 5, x \neq 1$

ex: $\frac{1}{2x} - \frac{2}{5x} = \frac{1}{2}$

EQ num. $\rightarrow \frac{5}{10x} - \frac{4}{10x} = \frac{5x}{10x}$ LCD: $10x$, $x \neq 0$

$5-4 = 5x$

$1 = 5x$ $x = 1/5$

ex: $\frac{3}{x+5} + \frac{-2}{5-x} = \frac{-4}{x^2-25}$

$-x+5$

$-(x-5)$

$(x-5)(x+5)$

LCD: $-(x-5)(x+5)$

$x \neq \pm 5$

$$\frac{-3(x-5)}{-(x-5)(x+5)} + \frac{-2(x+5)}{-(x-5)(x+5)} = \frac{-(-4)}{-(x-5)(x+5)}$$

$$-3(x-5) - 2(x+5) = 4$$

$$-3x+15-2x-10 = 4$$

$$-5x+5 = 4$$

$$-5x = -1$$

$$x = 1/5$$

ex: $\frac{3}{2x(x-1)} + \frac{4}{3(x-2)} = \frac{5x+1}{6x(x-1)}$

$x \neq 0, 1, 2$

LCD: $6x(x-1)(x-2)$

$$\frac{9(x-2)}{6x(x-1)(x-2)} + \frac{8x(x-1)}{6x(x-1)(x-2)} = \frac{(5x+1)(x-2)}{6x(x-1)(x-2)}$$

$$9x-18+8x^2-8x = 5x^2-10x+x-2$$

$$8x^2+x-18 = 5x^2-9x-2$$

$$3x^2+10x-16 = 0 \quad \text{Q.F.}$$

$$x = \frac{-10 \pm \sqrt{10^2-4(3)(-16)}}{2(3)}$$

$$x = \frac{-10 \pm \sqrt{100+192}}{6}$$

$$x = \frac{-10 \pm \sqrt{292}}{6}$$

$x =$

$x =$