

7.2 - Day 1 - Solving Rational Equations**Ex.1:** Solve. (Don't forget to check for extraneous solutions!)

$$\frac{4}{(x-2)} = \frac{(x-1)}{(x-2)}$$

restriction:  
 $x \neq 2$ 

cross-multiply

$$x^2 - 3x + 2 = 4x - 8$$

$$\underline{-4x} \quad \underline{+8} \quad \underline{-4x} \quad \underline{+8}$$

$$x^2 - 7x + 10 = 0$$

$$(x-5)(x-2) = 0$$

$$\boxed{x=5} \quad \boxed{x=2}$$

denominators are same!

$$4 = x - 1$$

$$\underline{+1} \quad \underline{+1}$$

$$\boxed{5 = x}$$

(set  
numerators  
=, and  
solve)**Ex.2:** Solve. $p \neq 0$ 

$$\frac{3}{3} \cdot \frac{(p+2)}{2p} + \frac{1}{6p} = \frac{1}{6} \cdot \frac{p}{p}$$

$$\frac{3p+6}{6p} + \frac{1}{6p} = \frac{p}{6p}$$

$$\text{Solve: } 3p+7 = p$$

$$7 = -2p$$

$$\boxed{p = \frac{7}{-2}}$$

**Ex.3:** Solve.

$$\frac{\frac{2}{2}(r-5)}{r^2} + \frac{\frac{1}{r}(r-3)}{2r} = \frac{1}{r} \cdot \frac{2r}{2r}$$

$$\frac{2r-10}{2r^2} + \frac{r^2-3r}{2r^2} = \frac{2r}{2r^2}$$

$$\begin{array}{r} r^2 - r - 10 = 2r \\ \underline{-2r} \quad \underline{-2r} \end{array}$$

$$\begin{aligned} r^2 - 3r - 10 &= 0 \\ (r+2)(r-5) &= 0 \end{aligned}$$

$$\boxed{r = -2} \quad \boxed{r = 5}$$

**Ex.4:** Solve.

$$\frac{(n-4)(2n+10)}{(n-4)n} + \frac{n(n-1)}{n(n-4)} + \frac{(n+3)(n-4)}{n(n-4)}$$

restrictions:  
 $n \neq 0, 4$

$$\frac{2n^2 + 2n - 40}{n(n-4)} = \frac{n^2 - n}{n(n-4)} + \frac{n^2 - n - 12}{n(n-4)}$$

add like terms:

$$\begin{array}{r} 2n^2 + 2n - 40 = 2n^2 - 2n - 12 \\ \underline{-2n^2 + 2n} \quad \underline{-2n^2 + 2n} \end{array}$$

$$\begin{array}{r} 4n - 40 = -12 \\ \underline{+40} \quad \underline{+40} \end{array}$$

$$4n = 28$$

$$\boxed{n = 7}$$