

Solving Rational Equations

Solve each equation. Remember to check for extraneous solutions.

1)  $\frac{1}{2} + \frac{3}{2k} = \frac{3}{2}$      $\frac{k}{2k} + \frac{3}{2k} = \frac{3}{2}$

$\left\{ \begin{matrix} 3 \\ 2 \end{matrix} \right\}$

$\frac{k+3}{2k} = \frac{3}{2}$

$2k+6 = 6k$

$6 = 4k$

$\frac{3}{2} = \frac{6}{4} = k$

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

$\{7\}$

$\frac{2p-4+1}{2p} = \frac{p+4}{2p}$

$\frac{2p-3}{2p} = \frac{p+4}{2p}$

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

$2p-3 = p+4$

$p=7$

3)  $\frac{5m+10}{m+6} - \frac{1}{m+6} = 1$

$\left\{ \begin{matrix} -3 \\ 4 \end{matrix} \right\}$

$\frac{5m+9}{m+6} = 1$

$5m+9 = m+6$

$4m = -3$

$m = -3/4$

4)  $\frac{1}{x} = \frac{3}{x+5} + \frac{1}{x^2+5x}$      $\frac{3(x)+1}{x(x+5)} = \frac{1}{x}$

$\{2\}$

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

$3x+1 = x+5$

$2x = 4$

$x=2$

5)  $\frac{(m-6)1}{m-4} - \frac{m+4(m-4)}{m-6} = \frac{m+6}{m^2-10m+24}$

$\{2, -2\}$

$-m^2+m+10 = m+6$

$0 = m^2-4$

$0 = (m+2)(m-2)$

$m = -2$   
 $m = 2$

$\frac{(m-6)}{(m-6)(m-4)} - \frac{(m+4)(m-4)}{(m-6)(m-4)}$

$\frac{m-6 - (m^2-16)}{(m-6)(m-4)} = \frac{m+6}{(m-6)(m-4)}$

$\frac{-m^2+m+10}{(m-6)(m-4)} = \frac{m+6}{(m-6)(m-4)}$

Denominators match → Just solve the top!

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

$\left\{ \frac{1}{3}, -1 \right\}$

$\frac{2}{3b^3+2b^2} = \frac{1+3b^2+2b}{3b^3+2b^2}$

$2 = 1+3b^2+2b$

$0 = 3b^2+2b-1$

$0 = (3b-1)(b+1)$

$b = 1/3$      $b = -1$