Rational Equations

Procedure

1. **Find the common denominator (CD) by factoring the denominators**
2. **Multiply both sides of the equation by the CD**
3. **Solve the resulting equation**
4. **Check your solution**

Example $\frac{4}{x+2} - \frac{2}{x-2} = \frac{-x}{x-2}$

1. CD = (x+2)(x–2)
2. $(x+2)(x-2)\left[\frac{4}{x+2} - \frac{2}{x-2}\right] = (x+2)(x-2)[\frac{-x}{x-2}]$
3. 4(x-2)–2(x+2) = –x(x+2)
   4x – 8 –2x – 4 = $-x^2$ –2x
   2x – 12 = $-x^2$ –2
   x^2 + 4x – 12 = 0
   (x+6)(x–2) = 0
   x = –6 or x = 2
   # x cannot be 2, makes the denominator 0, ∴ $x = -6$

1. $\frac{x}{x-6} = 3$

2. $\frac{x}{x-4} = 5$

3. $\frac{2x}{x-2} = \frac{5}{3}$

4. $\frac{x-3}{x+7} = 6$

5. $\frac{6}{x-1} + \frac{10}{x+1} = \frac{60}{x^2-1}$

6. $\frac{x}{x-2} + \frac{2}{x+2} = \frac{x^2+4}{x^2-4}$

7. $\frac{4x+3}{x^2-x-6} + \frac{x-4}{x=3} = \frac{x}{x-3}$

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

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

10. $\frac{x+6}{x-5} + \frac{x+2}{x-2} = \frac{x^2+20}{x^2-7x+10}$

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