

## 7.6

Friday, August 24, 2012  
10:53 AM

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Note Title

11/28/2006

## Solving Rational Equations

Recall that to solve proportions we used the cross-product

$$\textcircled{\text{ex}} \frac{x}{4} = \frac{6}{8}$$

$$\frac{x \swarrow \nearrow 6}{4 \nwarrow \searrow 8}$$

$$x \cdot 8 = 4 \cdot 6$$

$$\frac{8x}{8} = \frac{24}{8}$$

$$\textcircled{x = 3}$$

Do the same for rational expressions.

Solve

(Ex.)

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

$$\begin{aligned} x-2 &\neq 0 \\ x &\neq 2 \end{aligned}$$

$$\begin{aligned} x+1 &\neq 0 \\ x &\neq -1 \end{aligned}$$

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

don't forget the ( ).

$$5(x+1) = 3(x-2)$$

$$5x+5 = 3x-6$$

$$\begin{array}{r} -3x \quad -3x \\ 5x+5 = 3x-6 \end{array}$$

$$\begin{array}{r} 2x+5 = -6 \\ -5 \quad -5 \end{array}$$

$$\frac{2x}{2} = \frac{-11}{2}$$

$$x = -\frac{11}{2}$$

← since  $-\frac{11}{2}$  is NOT 2 or -1 (from above) I know that  $-\frac{11}{2}$  is my answer.

(ex.) Solve  $\frac{2}{x+3} = \frac{2x+1}{-1}$

$x+3 \neq 0$

$x \neq -3$

~~$\frac{2}{x+3} = \frac{2x+1}{-1}$~~

$2 \cdot -1 = (x+3)(2x+1)$

$-2 = 2x^2 + 1x + 6x + 3$

$-2 = 2x^2 + 7x + 3$

+2

+2

$0 = 2x^2 + 7x + 5$

$0 = (2x+5)(x+1)$

$2x+5=0$  or  $x+1=0$   
-5 -5                      -1 -1

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

$x = -1$

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

Since neither  $-\frac{5}{2}$  or  $-1$  is  $-3$  (from above) my answers are  $-\frac{5}{2}$  and  $-1$

(ex.) Solve  $\frac{2}{y-2} = \frac{4-y}{y-2}$

$$y-2 \neq 0$$

+2 +2

$$y \neq 2$$

$$y-2 \neq 0$$

$y \neq 2$

$$\frac{2}{y-2} = \frac{4-y}{y-2}$$

$$2(y-2) = (y-2)(4-y)$$

$$2y-4 = 4y-y^2-8+2y$$

$$2y-4 = -y^2+6y-8$$

$$+y^2 \quad +y^2$$

$$y^2+2y-4 = 6y-8$$

$$-6y \quad -6y$$

$$y^2-4y-4 = -8$$

$$+8 \quad +8$$

$$y^2-4y+4 = 0$$

$$(y-2)(y-2) = 0$$

$$y-2=0$$

+2 +2

or

$$y-2=0$$

+2 +2

$$y=2$$

or

$$y=2$$

but above we

decided that  $y \neq 2$

(because that's where we divided by

zero) so this problem has no answer.

A blank sheet of lined paper with a vertical red margin line on the left and horizontal blue lines for writing. The lines are evenly spaced and cover most of the page area.