

Day 9

key

# Rational Equations

- Step 1: Make sure equation is set up as a ratio = ratio.
- Step 2: Cross-Multiply!
- Step 3: For linear equations, just solve for the variable.



For ~~quadratic~~ equations, set equal to 0, then factor to solve! never mind - (or graph)

<p>1. <math>\frac{18}{x-1} \times \frac{6}{x+3}</math> <math>18(x+3) = 6(x-1)</math>  <math>18x + 54 = 6x - 6</math>  <math>12x = -60</math>  <math>x = -5</math></p>	<p>2. <math>\frac{x-1}{x+7} \times \frac{3}{5}</math> <math>5(x-1) = 3(x+7)</math>  <math>5x - 5 = 3x + 21</math>  <math>2x = 26</math>  <math>x = 13</math></p>
<p>3. <math>\frac{x}{6} = \frac{x-3}{4}</math> <math>4x = 6(x-3)</math>  <math>4x = 6x - 18</math>  <math>18 = 2x</math>  <math>9 = x</math></p>	<p>4. <math>\frac{5}{2} = \frac{x-8}{x-2}</math> <math>5x - 10 = 2x - 16</math>  <math>3x = -6</math>  <math>x = -2</math></p>
<p>5. <math>\frac{x}{x+3} = \frac{5}{x+7}</math> <math>x^2 + 7x = 5x + 15 \rightarrow x^2 + 2x - 15 = 0</math>  <math>(x-3)(x+5) = 0</math>  <math>x = 3</math> <math>x = -5</math></p>	<p>6. <math>\frac{4}{x} = \frac{x-8}{5}</math> <math>20 = x^2 - 8x \rightarrow 0 = x^2 - 8x - 20</math>  <math>(x-10)(x+2) = 0</math>  <math>x = 10</math> <math>x = -2</math></p>
<p>7. <math>\frac{x+1}{x} = \frac{-7}{x-12}</math> <math>-7x = x^2 - 11x - 12 \rightarrow 0 = x^2 - 4x - 12</math>  <math>0 = (x-6)(x+2)</math>  <math>x = 6</math> <math>x = -2</math></p>	<p>8. <math>\frac{x+2}{6} = \frac{3}{x-1}</math> <math>x^2 + x - 2 = 18</math>  <math>x^2 + x - 20 = 0</math>  <math>(x-4)(x+5) = 0</math>  <math>x = 4</math> <math>x = -5</math></p>
<p>9. <math>\frac{15}{x^2-1} = \frac{5}{2x-2}</math> <math>5x^2 - 5 = 30x - 30</math>  <math>5x^2 - 30x + 25 = 0</math>  <math>x^2 - 6x + 5 = 0</math>  <math>(x-5)(x-1) = 0</math>  <math>x = 5</math> <math>x = 1</math></p>	<p>10. <math>\frac{x-3}{2} = \frac{2x+5}{3x}</math> <math>3x^2 - 9x = 4x + 10 \rightarrow 3x^2 - 13x - 10 = 0</math>  <math>(3x+2)(x-5) = 0</math>  <math>x = -2/3</math> <math>x = 5</math></p>