

## Algebra: Friday, October 15, 2010

By: Eva Klimova

There are different methods to use to solve different algebraic equations. In each case we are looking for the value of x, so the value of the zero(s).

1.  $x+1=\frac{72}{x}$

$$x(x+1)=72$$

$$x^2+x=72$$

$$x^2+x-72=0$$

$$(x+9)(x-8)$$

In this case we took the denominator (x) and multiplied each side by x to get x on one side. Then we are left with easy algebra. We just distribute x(x+1) to get a quadratic equation that we can factor to get our zeros.

$$x=8, -9$$

2.  $\frac{10}{x+4} = \frac{15}{4(x+1)}$

$$\frac{10}{x+4} = \frac{15}{4x+4}$$

$$10(4x+4)=15(x+4)$$

$$40x+40=15x+60$$

$$25x=20$$

$$\frac{25}{20} = x$$

$$\frac{5}{4} = x$$

$$x = \frac{5}{4}$$

In this case we simply cross multiplied. We took the denominator from one side of the equal sign and multiplied it with the opposite numerator. We were then left with two expressions on either side that needed to be expanded. We then moved everything to one side making it all equal zero, and we then isolated x to get the zeros.

$$x = \frac{5}{4}$$

3.  $\frac{10}{x(x-2)} + \frac{4}{x} = \frac{5}{x-2}$

$$\frac{10}{x(x-2)} + \frac{4(x-2)}{x(x-2)} = \frac{5x}{x(x-2)}$$

$$\frac{10 + 4(x-2)}{x(x-2)} = \frac{5x}{x(x-2)}$$

$$10 + 4(x-2) = 5x$$

$$10 + 4x - 8 = 5x$$

$$10 + 4x - 8 - 5x = 0$$

$$0 = x - 2$$

$$0 = x - 2$$

We simply wanted the same denominator for each fraction, so we chose x(x-2) as our denominator and multiplied the fractions appropriately to get that denominator. Since each term in the equation had the same denominator we were able to discard it, leaving us with a simple equation. We then solved for x by isolating it.

$$x \neq 2 \text{ NO SOLUTION}$$

4.  $\frac{x}{x-2} + \frac{1}{x-4} = \frac{2}{x^2-6x+8}$  In this case we multiplied each fraction accordingly so that the denominators would be the same. We then got rid of the denominator because it was all the same and we were left with a simple equation. We rearranged this equation to make it equal to zero so we could then factor the equation to get our zeros. We solved for two values of x, although x=4 makes the function undefined.

$$\frac{x(x-4)}{x-2(x-4)} + \frac{x-2}{x-2(x-4)} = \frac{2}{x^2-6x+8}$$

$$\frac{x^2-4x}{x^2-6x} + \frac{x-2}{x^2-6x+8} = \frac{2}{x^2-6x+8}$$

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

$$x^2-3x-4=0$$

$$(x-4)(x+1)=0$$

$$x = -1$$

Here is a link that will talk more about what we just did:

[http://www.easymaths.com/Secrets\\_of\\_Algebra.htm](http://www.easymaths.com/Secrets_of_Algebra.htm)

#### Homework:

- Multiple choice, *Solving Rational Equations* math sheet
- Extra practice textbook questions : pg 61 #6 and pg 63 # 1-4, 6-9
- Rational functions quiz on Monday (Quick multiple choice)
- Unit Test on Friday