Factoring (solve)

Wednesday, March 30, 2016 11:41 AM

Let's Solve This Stuff!

Last class we did a whole lot of factoring. But, we didn't actually solve any of the equations! That's what today is for.

Here's what we do:

1. Set our equation equal to zero
   - ➢ Sometimes you may need to rearrange the equation
2. Factor.
   - ➢ Completely. We must have all multiplied terms.
3. If everything is multiplied, we can make the claim that at least one of those things must be zero.
   - ➢ If $xy=0$ then either x or y must be zero.

Example time!

$x^2 - 6x + 8 = 0$

$ab = 8$

$a+b = -6$

$-4, -2$

$(x^2 - 4x) - (2x - 8) = 0$

$x(x-4) - 2(x-4) = 0$

$(x-4)(x-2) = 0$

$x-4 = 0$ or $x-2 = 0$

$x = 4$ $\quad x = 2$

$4x^2 + 12x = -9$

$4x^2 + 12x + 9 = 0$

$ab = 9(4) = 36$

$a+b = 12$

$6, 6$

$(4x^2 + 6x) + (6x + 9)$

$2x(2x+3) + 3(2x+3)$

$(2x+3)(2x+3) = 0$

$(2x+3)^2 = 0$

$2x+3 = 0$

$2x = -3$

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

→ $6x^2 + 2x = 0$

$2x(3x+1) = 0$

$2x = 0$ or $3x+1 = 0$

$x = \frac{0}{2} = 0$ $\quad 3x = -1$

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

→ $2(4x-3)^2 + 7(4x-3) + 5 = 0$

Let $4x-3 = R$

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

$ab = 5(2) = 10$

$a+b = 7$

$5, 2$

$(2R^2 + 5R) + (2R + 5) = 0$

$R(2R+5) + (2R+5) = 0$

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

$(2[4x-3]+5)([4x-3]+1) = 0$

$(8x-6+5)(4x-3+1) = 0$

$(8x-1)(4x-2) = 0$

$8x-1 = 0$ or $4x-2 = 0$

$8x = 1$ $\quad 4x = 2$

$x = \frac{1}{8}$ $\quad x = \frac{2}{4} = \frac{1}{2}$

$x(x-1) = \frac{2}{1}x$

$x(x-1) = 2$

$x^2 - x - 2 = 0$

$x = 2, -1$

$Ax^2 + Bx + C = 0$

$\frac{x}{3} + \frac{2}{6} = 5$

$\frac{2x+2}{6} = 5$

$2x + 2 = 6(5)$

$2(x+1) = 30$

$x + 1 = \frac{30}{2}$

$x + 1 = 15$

$x = 14$

$x = 14$

We could also ask you to find the quadratic equation that has specific roots…

Example: Write a quadratic equation with the given roots:

$-5, -3 \rightarrow x = -5$ or $x = -3$

$x + 5 = 0$ $\quad x + 3 = 0$

$(x+5)(x+3) = 0$

$x^2 + 3x + 5x + 15 = 0$

$x^2 + 8x + 15 = 0$

→ 4, -2 ←

$x^2 - 2x - 8 = 0$

$-\frac{3}{2}, \frac{1}{4}$ $x = -\frac{3}{2}$ or $x = \frac{1}{4}$

$(2x+3)(4x-1) = 0$

$2x = -3$ $\quad 2x+3 = 0$

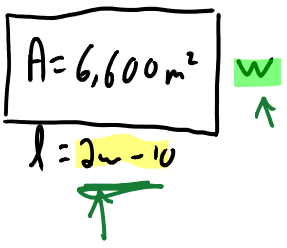
$4x = 1$ $\quad 4x-1 = 0$

$8x^2 - 2x + 12x - 3 = 0$

$8x^2 + 10x - 3 = 0$

Word Problem:

The Length of a lacrosse field is 10m less than twice the width. The area of the field is 6,600m^2. Find the dimensions of the field.



$A = lw = (2w-10)w = 6,600$

$2w^2 - 10w = 6,600$

$2w^2 - 10w - 6,600 = 0$

$2(w^2 - 5w - 3,300) = 0$ /2

$w^2 - 5w - 3,300 = 0$

$ab = -3300$

$a+b = -5$

$-60, 55$

$(w^2 - 60w) + (55w - 3300) = 0$

$w(w-60) + 55(w-60) = 0$

$(w-60)(w+55) = 0$

$w - 60 = 0$ OR $w + 55 = 0$

$w = 60$ ~~$w = -55$~~

if $w = 60$ then

$l = 2w - 10$

$= 2(60) - 10$

$= 120 - 10$

$= 110\text{ m}$

Quiz on this next class

HW: pg230
#7,9-11,12a,19,30