Day 31: Solving Quadratic Equations

Remember that a **quadratic equation** has a degree of _____. So y = (x + 1)(x – 3), which is in "factored form", is a quadratic because when you multiply it out, you would get y = _____ (standard form).
Today we are going to practice finding the x-intercepts, also called _____. Think about why they would be called zeros.... Sometimes you will see directions in a textbook say, "Solve the quadratic equation". This also means to find the x-intercepts (A.K.A.- zeros). To find the x-intercept of any equation, you can plug _____ in for *y*.

First try this: *Solve*: *ab* = 0 a = _____, b = _____

Why?

This is called the _____.

Solve.

1. $(x - 4)(x - 2) = y$	2. $(x - 5)(x + 7) = 0$
3. $(2x - 6)(x + 8) = 0$	4. $(5x + 35)(3x + 2) = y$

Now, let's try problems that are in factored form, but look a little different.

Ex 1: Solve: $3n(n - 5) = 0$

Ex 2: Find the zeros: $x(3x + 2) = 0$

You try: Find the zeros.

5. $a(a + 5) = 0$

6. $5s(s - 7) = 0$

7. $2x(2x - 1) = y$

8. $(x - 9)(x + 10) = 0$

9. $(x + 11)(x - 6) = 0$

10. $y = (2x + 4)(3x - 15)$

Factoring out a GCF to Solve

Factor: numbers or variables we multiply together to get a _____

Ex: 2 and 3 are factors of the product 6; 2, 3, x and y are factors of the product 6xy

Why is it important to factor? Because it take a complex expression and make it _____ . When we factor, we look for the GREATEST Common Factor (GCF).

Example: Factor the expression **8x + 4**.

The **greatest common factor** for 8x and 4, is 4.

If we divide each monomial by 4 we are left with 2x and 1, so the factored expression is now **4(2x+1)** . This is called **factored form**.

You try: Factor each expression.

1. 5x + 25 **2.** 2x + 10 **3.** 12x + 30

Example: Factor the expression $6x^2y + 14x^3y - 42x^4yz$

You try: Factor each expression.

4. $4x^4 + 24x^3$ **5.** $2x^2 - 8x$ **6.** $5x^3 + 30x^2 - 15x$

Let's combine the two concepts we've learned today (solving with the **Zero Product Property** and **Factoring out a GCF**) to solve quadratic equations.

Solve equation by factoring.

1) $20b^2 + 300b = 0$

2) $17k^2 - 221k = 0$

3) $14x^2 + 14x = 0$

4) $9k^2 + 81k = 0$

5) $3a^2 - 27a = 0$

6) $15m^2 + 165m = 0$

7) $16r^2 - 192r = 0$

8) $9p^2 - 90p = 0$

9) $14m^2 - 168m = 0$

10) $20n^2 - 280n = 0$