Wednesday March 14, 2018

How do I get ready for class?
1) On Desk: binder, pens/pencils
2) You are tardy if you are not in your seat when the bell rings

Homework:
Zero Product Property

Upcoming……
Quiz Tomorrow!

Warm Up: Factor the following quadratic expressions.

1) $x^2 - 100$ 2) $p^2 - 36$ 3) $x^2 - 12x + 36$

$(p-6)(p+6)$ $(x-6)^2$

Homework Review

Now Grading:

• Special Products

Any Questions?

Standards

MGSE9–12.A.SSE.3 Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

MGSE9–12.A.SSE.3a Factor any quadratic expression to reveal the zeros of the function defined by the expression.
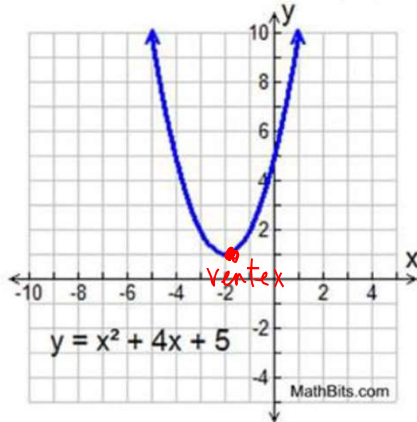
What do you already know about these standards?

Zero Product Property

Quadratic Graphs

Look at the following graph. Do you know what type of graph this is? List some of the things you see:

$y = x^2 + 4x + 5$

Vertex

MathBits.com

• Graph is a function
• U-shaped

Main Characteristics of Quadratic Functions

- A quadratic function always has a degree of __2__.
- The standard form of a quadratic function is:
  $$f(x) = ax^2 + bx + c$$
- The U – shaped graph is called a __parabola__.
- The highest or lowest point on the graph is called the __vertex__.
- The points ~~whether~~ *where* the graph crosses the x-axis are called the __x-intercepts or roots / solutions / zeros__
- The points where the graph crosses are also called the __Solutions__ to the quadratic equation. A quadratic equation can have __0__, __1__, or __2__ solutions.
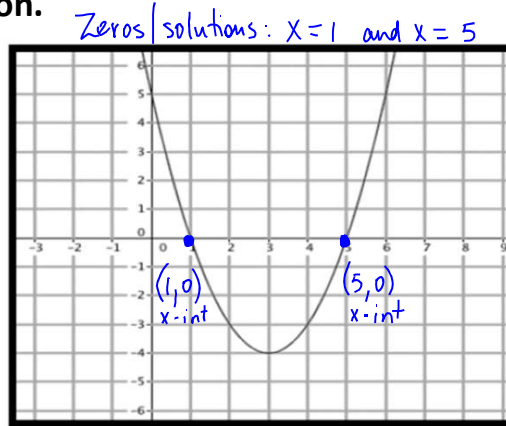
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Finding Zeros on Quadratic Graphs

Find the zeros of the following graphs and then factor the quadratic expression. (solutions/x-intercepts/roots)

1. $y = x^2 - 6x + 5$

$y = (x-5)(x-1)$

a·c
$\dfrac{5}{-5 \times -1}$
b
-6

Zeros/solutions: $x = 1$ and $x = 5$

$(1,0)$ x-int
$(5,0)$ x-int

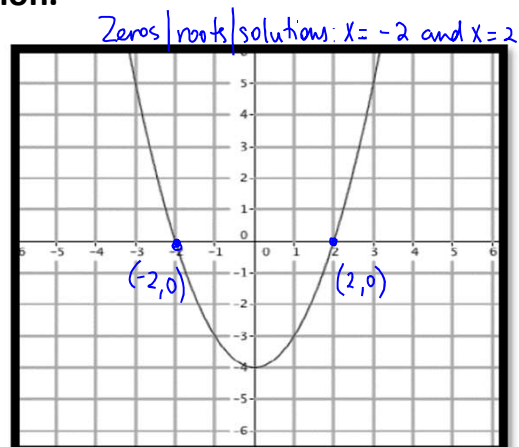## Finding Zeros on Quadratic Graphs

Find the zeros of the following graphs and then factor the quadratic expression.

Diff. of Squares

2. $y = x^2 - 4$

$y = (x-2)(x+2)$

Zeros/roots/solutions: $x = -2$ and $x = 2$

$(-2,0)$
$(2,0)$

4

Finding Zeros on Quadratic Graphs

What do you notice about the zeros and the factored form of the equation?

$y = (x-1)(x-5)$

The signs are opposite

$x = 1 \quad x = 5$

What is the value of y when the parabola crosses the x-axis for each graph?

$y = 0$

Zero Product Property (ZPP)

The ***zero product property*** is used to solve an equation when one side is zero and the other side is a product of binomial factors.

If $a \cdot b = 0$, then ___ $a = 0$ ___ or ___ $b = 0$ ___.

What it means: If we have two algebraic expressions equal to zero, then one of the expressions is equal to zero.

Solving by Factoring and using the Zero Product Property

1. Get all terms together on one side of the equation.
2. Set one side equal to zero.
3. Factor completely, if necessary.
4. Set each factor equal to zero.
5. Solve and list solutions as x = _____.

Zero Product Property

Solve each equation by using the Zero Product Property.

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

$$X - 2 = 0 \qquad X + 4 = 0$$
$$+2 \quad +2 \qquad -4 \quad -4$$
$$X = 2 \qquad X = -4$$

$$X = \{-4, 2\}$$

Solutions/roots/
Zeros

$$X = 0 \qquad X + 4 = 0$$
$$\qquad\qquad -4 \quad -4$$
$$\qquad\qquad X = -4$$

$$X = \{-4, 0\}$$

solutions/roots/
Zeros

Zero Product Property

Solve each equation by using the Zero Product Property.

3. $y = x^2 - 6x + 9$

$0 = \overset{x\,2}{x^2} - 6x + \overset{3}{9}$ (Factor - Perfect Square Trinomial)

$0 = (x - 3)^2$

$X - 3 = 0$
$\underline{+3 \quad +3}$
$X = 3$

Zero Product Property

Solve each equation by using the Zero Product Property.

4. $x^2 + 4x = 32$

$ -32 \quad -32$

$X^2 + 4X - 32 = 0$

$(X + 8)(X - 4) = 0$

$a \cdot c$
-32

$+8 \quad -4$

4

$X + 8 = 0 \qquad X - 4 = 0$

$X = -8 \qquad X = 4$

$X = \{-8, 4\}$