

Unit 2 Exam Review Lesson

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Chapter 4: Quadratic Relations

Chapter 5: Quadratic Expressions

Chapter 6: Quadratic Equations

What is the vertex? What is the axis of symmetry? and Describe the transformation compared to $y=x^2$?

$$y = 3(x+20)^2 - 15$$

Write the equation of the graph based on the description of the transformation:

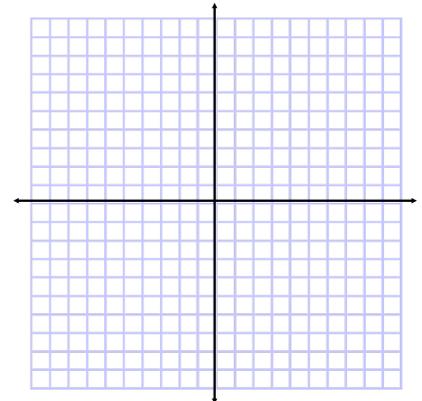
Vertical compression by a factor of $1/5$. Shift 3 right and 1 down:

Fill in the following table for the quadratic function shown and then graph it.

Property	$y = -1/2(x - 1)^2 + 8$
Vertex	
Axis of Symmetry	
Stretch or compression factor ("a" value)	
Direction of Opening	
Values x may take	
Values that y may take	

$$y = -1/2(x - 1)^2 + 8$$

x	y



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FACTORED FORM

$$y = a(x - r)(x - s)$$

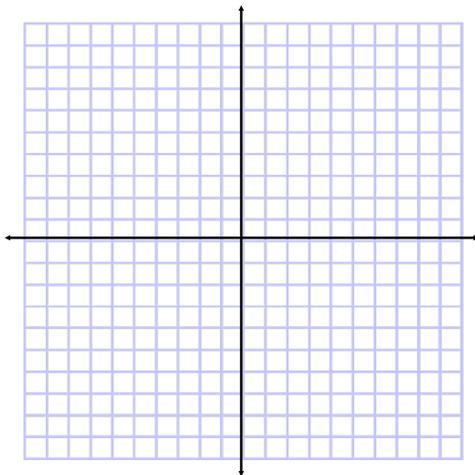
State the x-intercepts of:

a) $y = 5(2x-3)(x-2)$

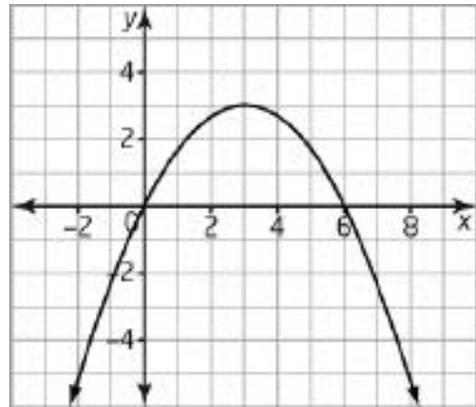
Sketch the graph of $y = 2(x+1)(x-7)$, label the x-intercepts, vertex, and axis of symmetry

Before sketching you must:

- Find the x-intercepts?
- Find the axis of symmetry?
- Find the vertex?



Determine an equation in the form $y = a(x-r)(x-s)$ to represent the parabola. Consider the vertex and the x-intercepts



How to write the equation of a parabola in factored form:

- Find the x-intercepts: r and s
- Find another point on the graph (x,y)
- Plug values for r,s,x , and y into $y=a(x-r)(x-s)$
- Solve for a
- Write the final equation by plugging in values for a,r , and s . Not x and y .

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CHAPTER 5/6

- **Multiply Polynomials:** FOIL method
- Common Factoring
- Factoring $ax^2 + bx + c$ where 'a' is 1 or can be factored out and when 'a' is not 1 and can't be factored out.
- Solve by Factoring or Quadratic Formula
- Graph quadratics in standard form
- Completing the Square
- Applications

Simplify $4(x-2)(x+4)$ by using FOIL

Greatest Common Factor: The greatest number and/or variable that is a factor of two or more terms.

Method:

To factor a polynomial:

- 1) remove the GCF as the first factor
- 2) and then divide each term by the GCF to obtain the second factor.

Factor: $25x^6 + 15x^4$

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HOW TO SOLVE QUADRATICS

Solving a quadratic means to find the x-intercepts or roots.

To solve a quadratic equation:

- 1) It must be set to equal 0. Before factoring, it must be in the form $ax^2 + bx + c = 0$
- 2) Factor the left side of the equation
- 3) Set each factor to equal zero and solve for 'x'.

zero product rule: if two factors have a product of zero; one or both of the factors must equal zero.

$$\text{Solve } x^2 + 9x = -14$$

$$\text{Solve } 2x^2 - 11x = -15$$

Use the Quadratic Formula to solve:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$0 = 2x^2 + 9x + 6$$

a =

b =

c =

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$$\text{Rule: } (a+b)^2 = a^2 + 2ab + b^2$$

$$\text{Rule: } (a-b)^2 = a^2 - 2ab + b^2$$

To go from standard form to vertex form, you must go through the process of completing the square

Steps to Completing the Square:

- 1) Put brackets around the first two terms
- 2) Factor out the common number (not the letter)
- 3) Look at the last term in the brackets, divide it by 2 and then square it.
- 4) Add and subtract that term behind the last term in the brackets.
- 5) Move the negative term outside of the brackets by first multiplying it by the 'a' value.
- 6) Simplify the terms outside of the brackets
- 7) Factor the perfect square trinomial

Convert the following equation into the vertex form (completing the square)

$$y = 2x^2 + 12x - 13$$