**Unit 8: Quadratics and roots**

**Lesson 3: Quadratics in vertex form**

**Objectives:**

* I can identify the vertex form of a quadratic
* I can change the vertex form to standard form or factored form of a quadratic

**Agenda:**

* Quiz
* Video
* Practice

**Focus Questions:**

* How can we change the quadratic vertex form to standard form or factored form?
* How can I identify the vertex looking the quadratic vertex form quadratic?

**Vocabulary:**

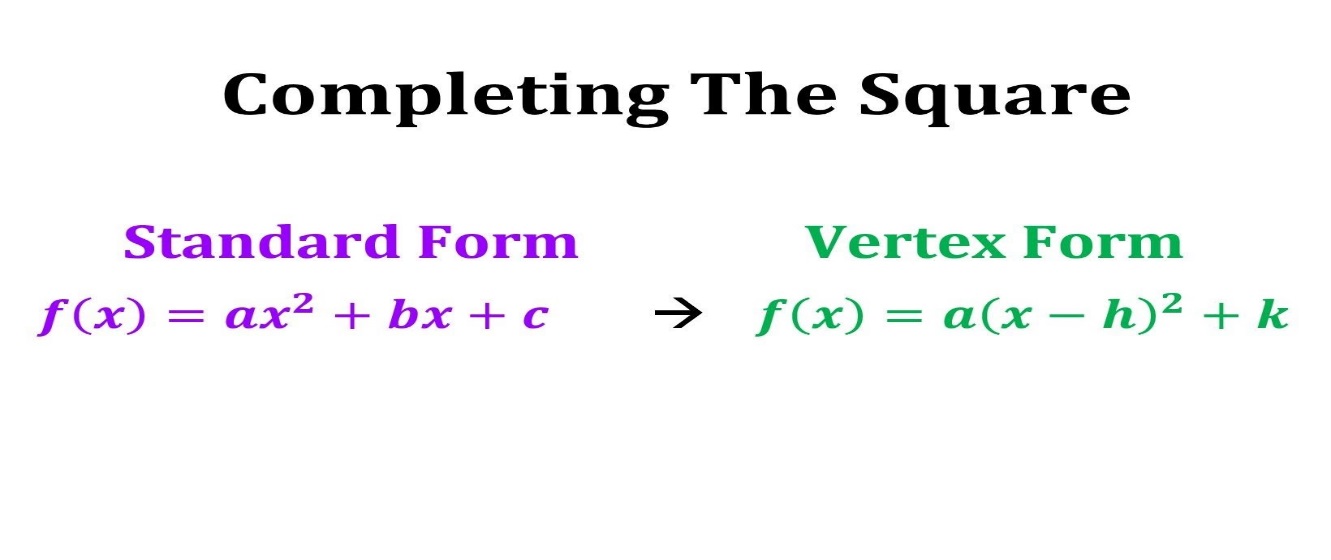
* **Perfect Square, factored form, standard form, Vertex form**

**Homework: HW 8-4**

**Online support:**

* <https://www.youtube.com/watch?v=jGJrH49Z2ZA> Fun

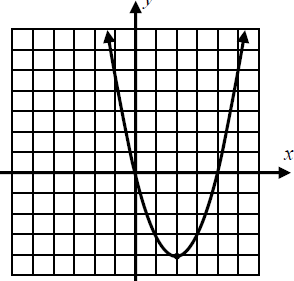
<https://www.youtube.com/watch?v=xGOQYTo9AKY>



Do Now:

Given the following graph of a parabola, answer the following:

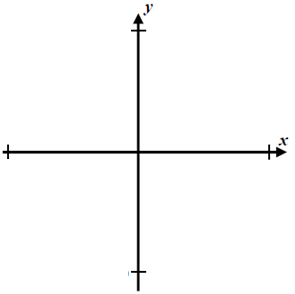
1. list the roots: \_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

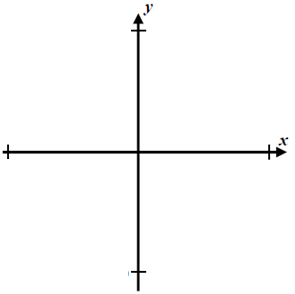
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1. What is the Axis of Symmetry: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is the Vertex?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Max or Min
3. The formula to find the axis of symmetry is: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Factoring Feb:

1. Which is a factor of *x*2 + 5*x* – 24?
2. (*x* + 4) 3. (*x* – 4)
3. (*x* + 3) 4.  (*x* – 3)
4. One of the factors of 4*x*2 – 9 is
5. (*x* + 3) 3. (2*x* + 3)
6. (4*x* – 3) 4. (*x* – 3)
7. Factor:
9. Sketch each of the following quadratics and use a table of value to find the coordinate of the turning point (vertex) from the calculator.





**Solve by taking the square root:**

|  |  |
| --- | --- |
|  | **2)** |
| **3)** | **4)** |

**Vertex Form vs Standard form:** <https://www.youtube.com/watch?v=jGJrH49Z2ZA>

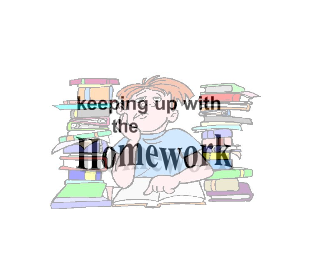
|  |
| --- |
| **Steps for Completing the Square using the vertex form** |

|  |  |
| --- | --- |
| **1.** Check if the coefficient of the quadratic is one. If it is not, divide each term by that value to create a leading coefficient of one. This include negative. | http://www.regentsprep.org/Regents/math/algtrig/ATE12/comple1.gif |
| **2.** Rewrite your quadratic in the standard form. | http://www.regentsprep.org/Regents/math/algtrig/ATE12/comple3.gif |
| **3.** Prepare to add the needed value to create the perfect square trinomial. Be sure to balance the equation. The boxes may help you remember to balance. | http://www.regentsprep.org/Regents/math/algtrig/ATE12/comple4.gif |
| **4.** Take half of the coefficient of the *middle term* (*x*-term), square it, and add that value to both sides of the equation to keep the equation balanced. http://www.regentsprep.org/Regents/math/algtrig/ATE12/halfmiddle.gif | http://www.regentsprep.org/Regents/math/algtrig/ATE12/comple5.gif |
| 5. Factor the perfect square trinomial. | http://www.regentsprep.org/Regents/math/algtrig/ATE12/comple6.gif |
| 6. Solve by taking the square root? |  |
|  |  |
|  |  |

Follow the Exact steps from the notes above: Examples: Solve each example by completing the square.

1. 2.

***3. 4.***

**Name: \_\_\_\_\_\_\_\_\_\_\_\_ Algebra I**

**Homework 8-3 Vertex form**

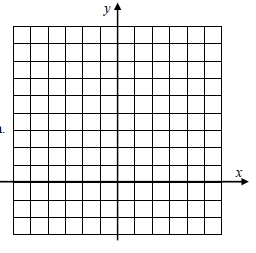
1. Write each of the following quadratic into vertex form. Then, identify the coordinates of its turning point.

**a)  b)**

1. A goalie kicks a soccer ball with an upward. The quadratic function

, represents the height of the ball h in feet after t seconds

1. What is the highest distance the ball travels?



1. At what time does the ball reaches that height?
2. Calculate the equation for the axis of symmetry algebraically.

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