

Unit 5 Part 1

Lesson 6

Solving by Graphing

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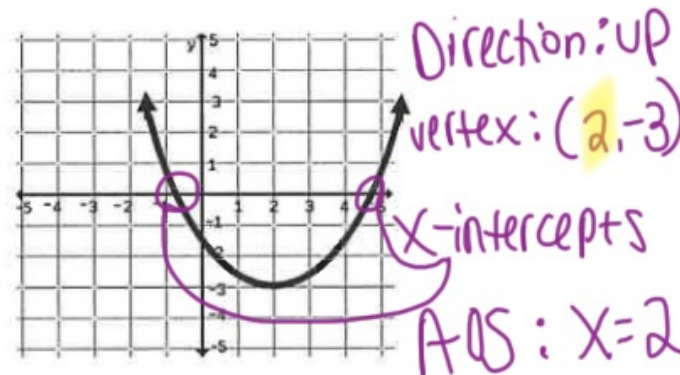
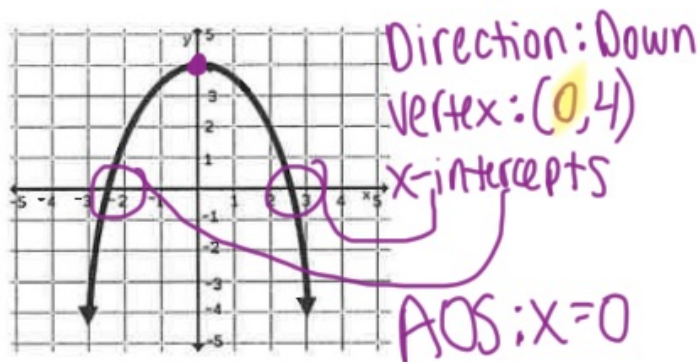
Lesson 1 → Graphing Quadratic Functions

I. Definitions:

A) Quadratic Equation:  $y = \overset{\text{Standard}}{ax^2 + bx + c}$  OR  $y = \overset{\text{Vertex}}{(x-h)^2 + k}$

B) The graph of a quadratic function is called a parabola.

C) The vertex of a parabola is the highest or lowest point of the parabola.



D. The axis of symmetry is an imaginary vertical line that runs through the vertex and divides the parabola into two equal parts. It is always written as  $x =$

E. The x-intercepts/solutions/roots/zeros of the graph are the points where the graph crosses or touches the x-axis.



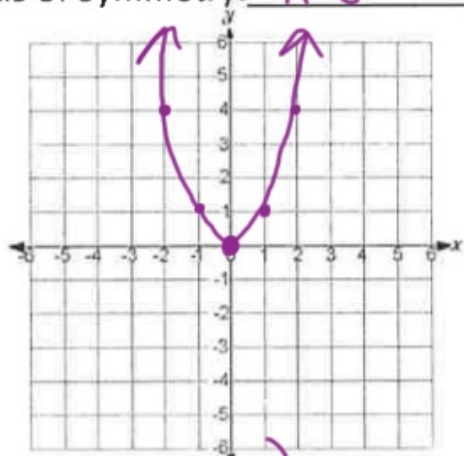
<p>1. <math>y = x^2</math></p> <p>Vertex: <u>(0,0)</u></p> <p>Axis of Symmetry: <u><math>x=0</math></u></p> <p>Direction: <u>up</u></p> <p>x-intercepts: <u>(0,0)</u></p>	<p>2. <math>y = -x^2</math></p> <p>Vertex: <u>(0,0)</u></p> <p>Axis of Symmetry: <u><math>x=0</math></u></p> <p>Direction: <u>Down</u></p> <p>x-intercepts: <u>(0,0)</u></p>	<p>3. <math>y = x^2 - 6</math></p> <p>Vertex: <u>(0,-6)</u></p> <p>Axis of Symmetry: <u><math>x=0</math></u></p> <p>Direction: <u>up</u></p> <p>x-intercepts: <u>(0,2.45)</u> <u>(0,-2.45)</u></p>	<p>4. <math>y = -x^2 + 4</math></p> <p>Vertex: <u>(0,4)</u></p> <p>Axis of Symmetry: <u><math>x=0</math></u></p> <p>Direction: <u>Down</u></p> <p>x-intercepts: <u>(-2,0)</u> <u>(2,0)</u></p>
<p>5. <math>y = (x - 3)^2</math></p> <p>Vertex: <u>(3,0)</u></p> <p>Axis of Symmetry: <u><math>x=3</math></u></p> <p>Direction: <u>up</u></p> <p>x-intercepts: <u>(3,0)</u></p>	<p>6. <math>y = -(x + 5)^2</math></p> <p>Vertex: <u>(-5,0)</u></p> <p>Axis of Symmetry: <u><math>x=-5</math></u></p> <p>Direction: <u>Down</u></p> <p>x-intercepts: <u>(-5,0)</u></p>	<p>7. <math>y = -(x + 6)^2 + 7</math></p> <p>Vertex: <u>(-6,7)</u></p> <p>Axis of Symmetry: <u><math>x=-6</math></u></p> <p>Direction: <u>Down</u></p> <p>x-intercepts: <u>(-8,646,0)</u> <u>(-3,354,0)</u></p>	<p>8. <math>y = (x - 1)^2 - 3</math></p> <p>Vertex: <u>(1,-3)</u></p> <p>Axis of Symmetry: <u><math>x=1</math></u></p> <p>Direction: <u>up</u></p> <p>x-intercepts: <u>(2,732,0)</u> <u>(-1,32,0)</u></p>

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### III. Graphing Quadratic Functions:

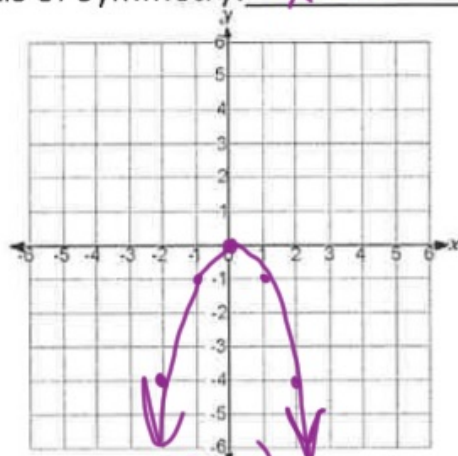
- Name the vertex (V), axis of symmetry (AoS), direction (D) of each equation and x-intercepts.
- Graph each equation as a parabola.

1.  $y = x^2$   
 V: (0,0)      D: up  
 Axis of Symmetry: X=0



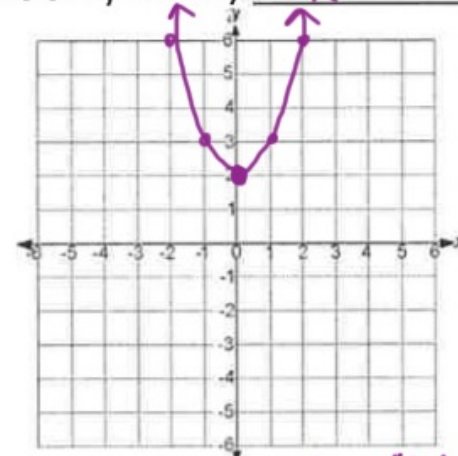
x-intercepts: (0,0)

2.  $y = -x^2$   
 V: (0,0)      D: down  
 Axis of Symmetry: X=0



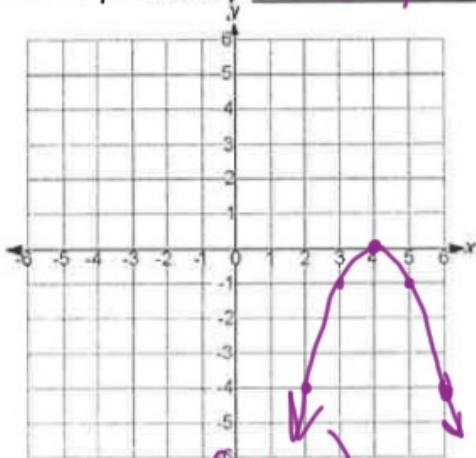
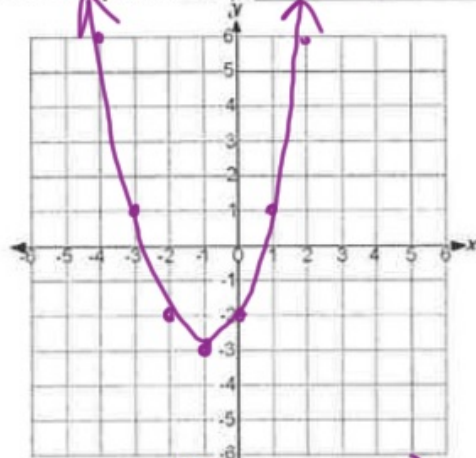
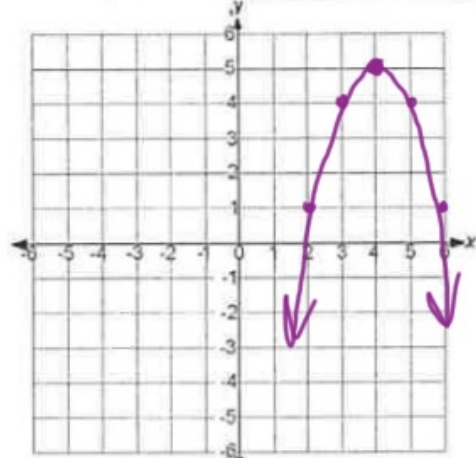

x-intercepts: (0,0)

3.  $y = x^2 + 2$   
 V: (0,2)      D: UP  
 Axis of Symmetry: X=0



x-intercepts: N/A / None

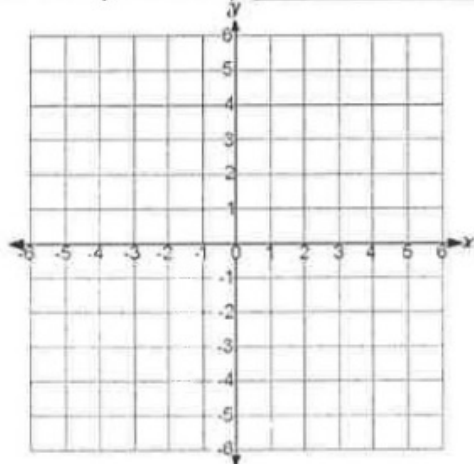
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<p>4. <math>y = -(x - 4)^2</math></p> <p>V: <u>(4,0)</u>      D: <u>down</u></p> <p>Axis of Symmetry: <u>x=4</u></p>  <p>x-intercepts: <u>(4,0)</u></p>	<p>5. <math>y = (x + 1)^2 - 3</math></p> <p>V: <u>(-1,-3)</u>      D: <u>up</u></p> <p>Axis of Symmetry: <u>x=-1</u></p>  <p>x-intercepts: <u>(-2.732,0)</u> <u>(.732,0)</u></p>	<p>6. <math>y = -(x - 4)^2 + 5</math></p> <p>V: <u>(4,5)</u>      D: <u>down</u></p> <p>Axis of Symmetry: <u>x=4</u></p>  <p>x-intercepts: <u>(1.764,0)</u> <u>(6.236,0)</u></p>
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7.  $y = 2(x - 1)^2 - 4$

V: \_\_\_\_\_ D: \_\_\_\_\_

Axis of Symmetry: \_\_\_\_\_

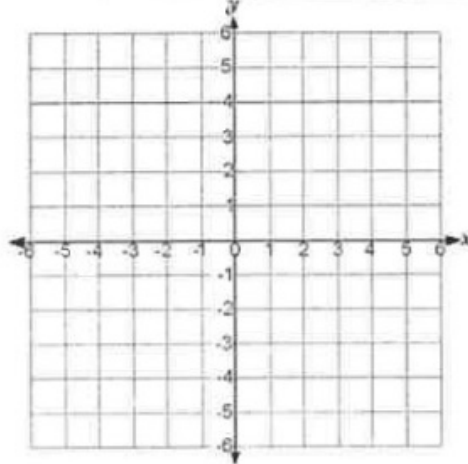


x-intercepts: \_\_\_\_\_

8.  $y = -2(x + 2)^2 + 4$

V: \_\_\_\_\_ D: \_\_\_\_\_

Axis of Symmetry: \_\_\_\_\_

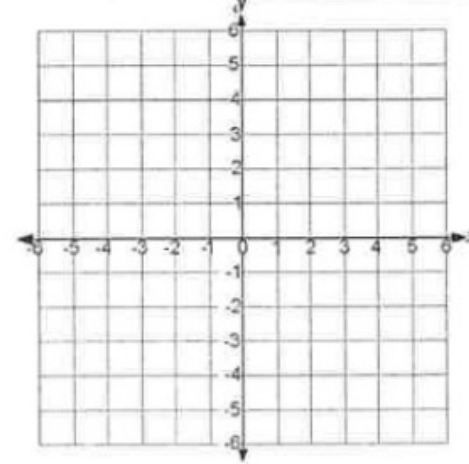


x-intercepts: \_\_\_\_\_

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

V: \_\_\_\_\_ D: \_\_\_\_\_

Axis of Symmetry: \_\_\_\_\_



x-intercepts: \_\_\_\_\_

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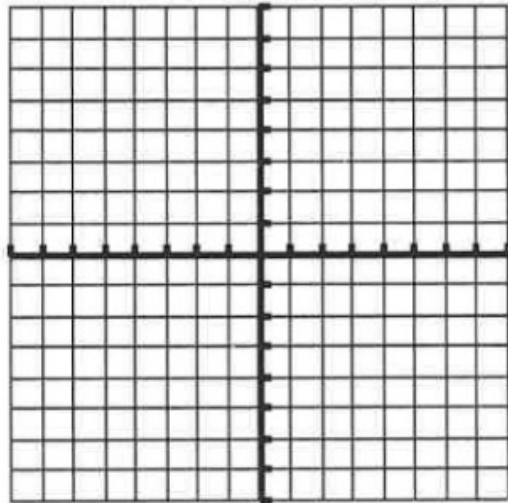
1.  $y = (x - 1)^2 + 2$

Vertex: \_\_\_\_\_

A.O.S.: \_\_\_\_\_

Direction: \_\_\_\_\_

x-intercepts: \_\_\_\_\_



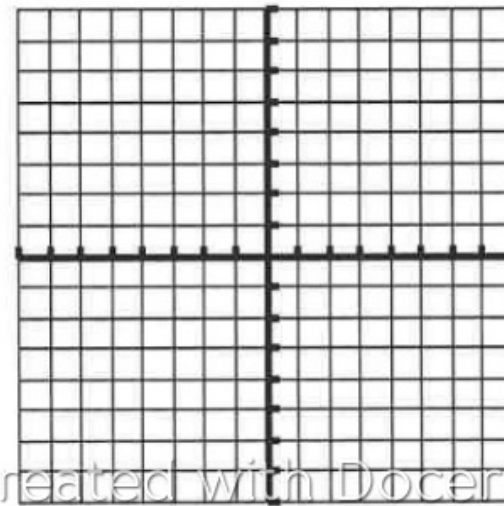
2.  $y = -2(x + 2)^2 + 5$

Vertex: \_\_\_\_\_

A.O.S.: \_\_\_\_\_

Direction: \_\_\_\_\_

x-intercepts: \_\_\_\_\_



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A large rectangular area with a black border, containing horizontal blue lines for writing. The lines are evenly spaced and extend across the width of the box. In the bottom right corner of this area, there is a watermark that reads "Created with Doceri" in a light gray font, followed by a green hand icon with the index finger pointing upwards.