



Functions and Applications

Chapter 1: Introduction to the Quadratic Function

1.5 Graphing Quadratic Functions by Using Transformations



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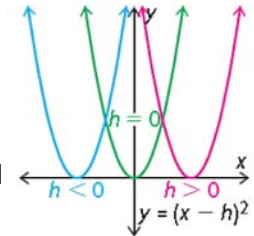
Chapter 1: Introduction to the Quadratic Function

1.5 Graphing Quadratic Functions by Using Transformations

$$f(x) = a(x-h)^2+k$$

'h' - the horizontal translation

- effects y-values
- moves left to right
- does opposite of what you are told
- $V(h,0)$



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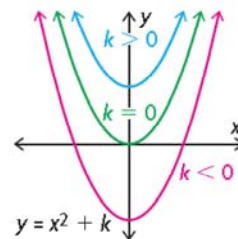
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1.5 Graphing Quadratic Functions by Using Transformations

$$f(x) = a(x-h)^2+k$$

'k' - the horizontal translation

- effects x-values
- moves up and down
- do what you are told
- $V(0,k)$



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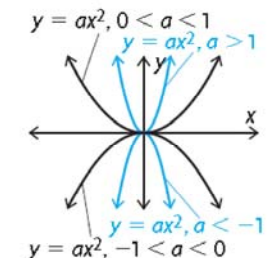
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1.5 Graphing Quadratic Functions by Using Transformations

$$f(x) = a(x-h)^2+k$$

'a' - the vertical stretch

- effects y-values
- is a **multiplier** transformation
- do what you are told
- $V(0,0)$

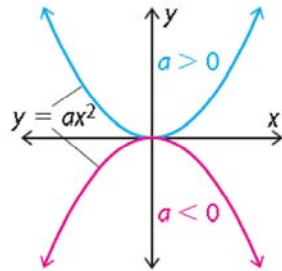




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Transforming Using a table:

x	y
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9



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Use transformations to sketch the graph of $h(x) = 2(x - 4)^2$.

x	y
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9



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Use transformations to sketch the graph of $g(x) = -0.5(x + 2)^2$.

x	y
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9



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Use transformations to sketch the graph of $m(x) = \frac{1}{3}x^2 + 2$.

X	Y
-3	9
-2	4
-1	1
0	0
1	1
2	4
3	9



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2. For each function,
- identify the values of the parameters a , b , and h
 - identify the transformations
 - use transformations to graph the function and check that it is correct with a table of values or a graphing calculator
- $f(x) = -3x^2$
 - $f(x) = (x + 3)^2 - 2$
 - $f(x) = (x - 1)^2 + 1$
 - $f(x) = -x^2 - 2$
 - $f(x) = -(x - 2)^2$
 - $f(x) = \frac{1}{2}(x + 3)^2$



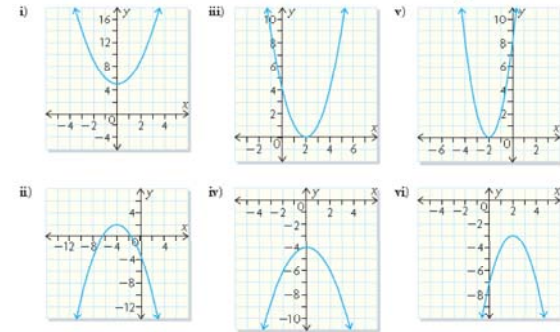
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1. Match each equation with its corresponding graph. Explain how you made your decision.

- a) $y = -(x - 2)^2 - 3$ c) $y = x^2 + 5$ e) $y = (x - 2)^2$
 b) $y = -0.5x^2 - 4$ d) $y = 2(x + 2)^2$ f) $y = -\frac{1}{3}(x + 4)^2 + 2$



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Homework:

Page 47-48 Questions 3-5,7,9,10