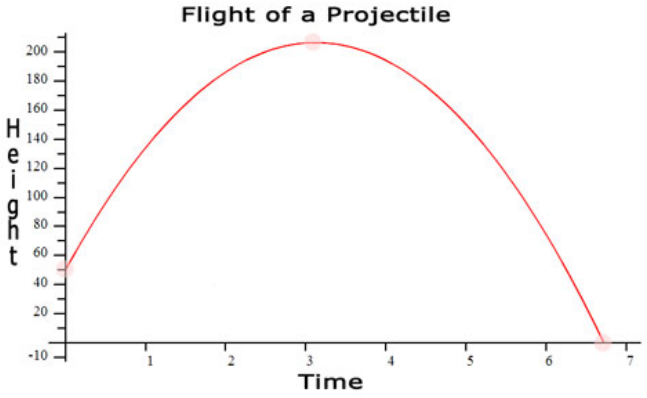
Algebra 2
4-1a Quadratic Functions & Transformations

Name _____
Date _____ **A#1, 2**

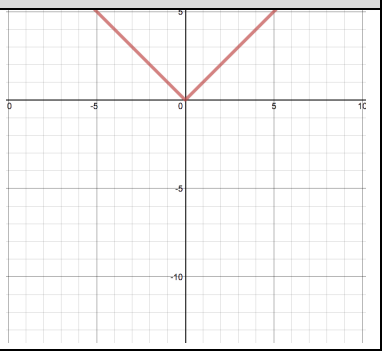
Goal: To identify and graph quadratic functions

I. Warm Up:
The graph on the right models a projectile launched in the sky. If height is measured in feet and time in seconds, complete the following analysis of the graph.

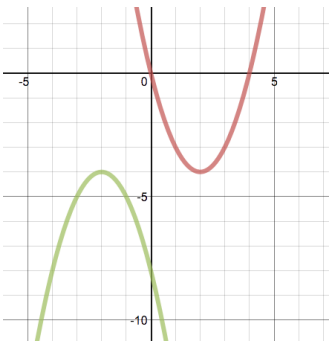


a. At what height does the projectile begin? _____
b. What is it the maximum height? _____
c. When does it reach its maximum height? _____
d. When does it hit the ground? _____

II. Review: Family of Functions

	Families	Example: Absolute Value Function	Graph
Form	$y = af(x-h)+k$	$y = -2\lvert x+4\rvert - 7$	
Parent Function			
Shift			
Reflection			
Vertical Stretch			

III. Vocabulary



A. parabola:

B. quadratic function:

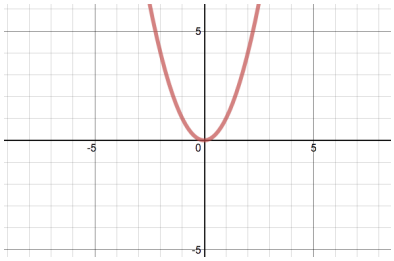
C. vertex:

D. *x*-intercepts:

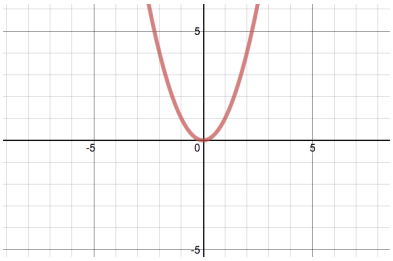
E. vertex form: $y = a(x-h)^2 + k$

IV. Graphing Stretches: Graph each function. How is it a stretch of $f(x)=x^2$?

a. $g(x)=-\frac{1}{2}x^2$

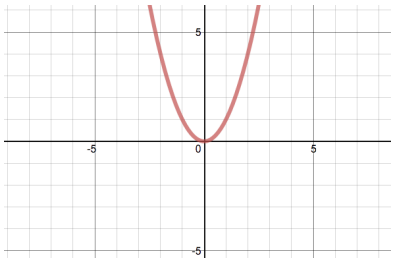


b. $h(x)=2x^2$

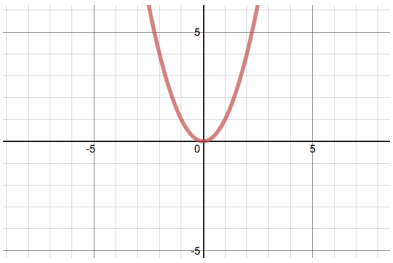


V. Graphing Translations: Graph each function. How is it a translation of the parent function $f(x)=x^2$?

a. $g(x)=x^2-3$

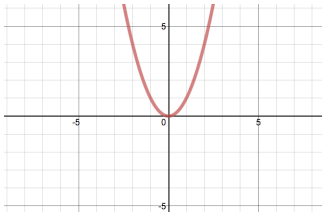


b. $h(x)=(x-4)^2$

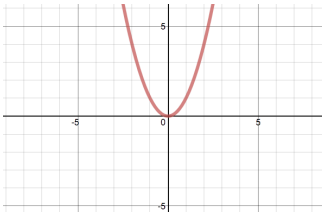


Practice: Graph each function. Describe how it is transformed from the parent function $f(x)=x^2$.

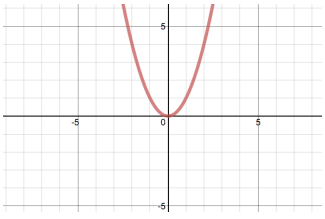
7. $y=-x^2$



8. $f(x)=5x^2$



9. $y=\frac{2}{5}x^2$



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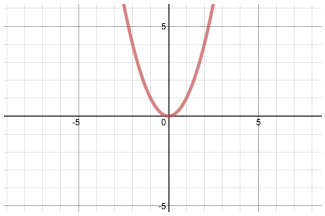
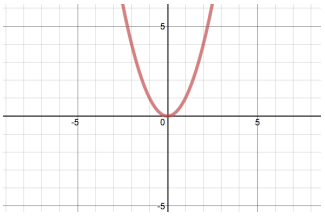
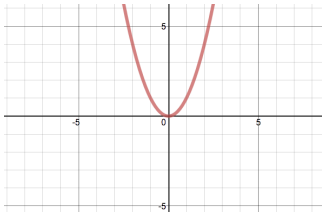
10. $y = 2x^2$



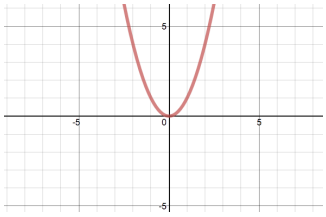
11. $y = -2x^2$



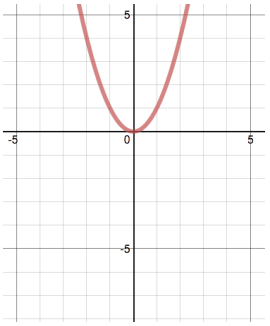
15. $f(x) = x^2 + 3$



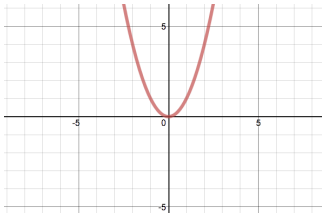
16. $f(x) = (x-2)^2$



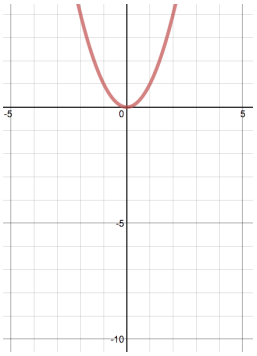
17. $f(x) = x^2 - 6$



18. $f(x) = (x+3)^2$



19. $f(x) = x^2 - 9$



20. $f(x) = (x+5)^2$