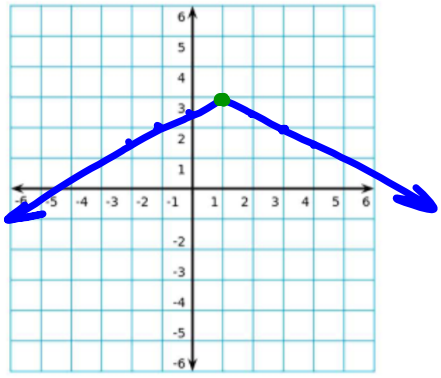
Grab yellow note page off front table!

Bell Ringer

Wednesday 10/9

1. Graph the absolute value function $f(x) = -\frac{1}{2}|x-1|+3$



2. Identify the vertex of the graph (1 , 3)

3. Identify the domain and range of the function:

D: all real numbers $(-\infty, \infty)$ R: $(-\infty, 3]$ $y \leq 3$

Week #7 Packet due

Write name legibly please

Score review based on completion

Add up total points in given box!

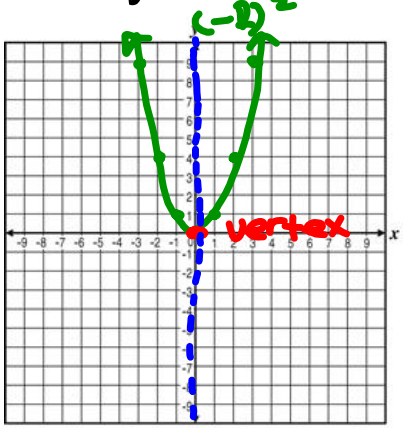
Get out notes!

Essential Questions

What are some of the characteristics of the graph of a quadratic function of the form $f(x) = ax^2$?

How does the value of c affect the graph of $f(x) = ax^2 + c$?

$y = x^2$



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

Vertex: (0, 0)

Axis of symmetry: x = 0

from vertex:

out 1 , up 1

out 2 , up 4

out 3 , up 9

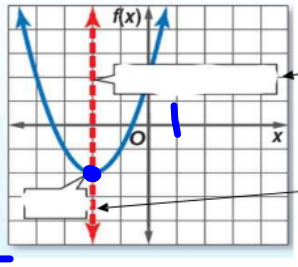
Parts of a Parabola and Their Properties in Class Notes

Vocabulary Section: For questions 1-11, fill in each blank using the word bank.

~~Vertex~~	~~minimum~~	~~axis of symmetry~~	~~y-values~~	~~parabola~~	~~maximum~~	~~x-values~~
Quadratic Parent Function	zeros/roots/x-intercepts	~~$y = ax^2 + bx + c$~~		y-intercept		

1. Standard form of a quadratic function is $y = ax^2 + bx + c$

2. The shape of a quadratic equation is called a parabola



3. axis of symmetry

4. vertex

5. When the vertex is the highest point on the graph, we call that a maximum.

6. When the vertex is the lowest point on the graph, we call that a minimum.

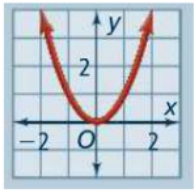
7. The Domain of a function is the complete set of all the x-values of the function.

8. The Range of a function is the complete set of all the y-values of the function.

*9. Solutions to quadratic equations are called zeros / roots / x-intercepts.

10. When the quadratic function is in standard form "c" is the y-intercept.

11. $y = x^2$ Quadratic Parent Function.

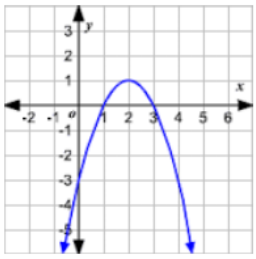


Set Builder Notation: $x \le 0$ or $y \ge 0$ etc. (you state where the values of the function are headed from x or y)

Interval Notation: [,] or (,) (you put your starting x value and your ending x value, use brackets if the number is included and parenthesis if it is not, always go from low to high)

What are the Domain and Range for these quadratic graphs?

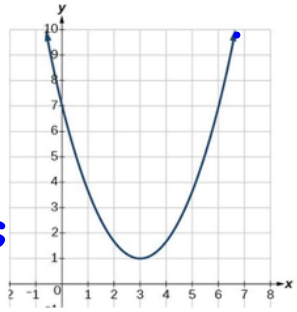
12. *Interval Notation*:
Domain: $(-\infty, \infty)$
Range: $(-\infty, 1]$



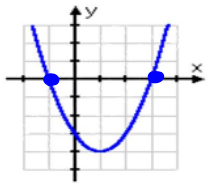
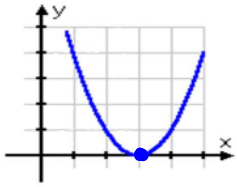
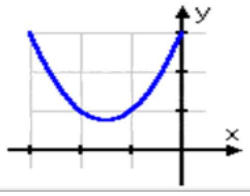
13. *Set Builder Notation:*
Domain: All real #s
Range: $y \le 1$

14. *Interval Notation*:
Domain: $(-\infty, \infty)$
Range: $[1, \infty)$

15. *Set Builder Notation:*
Domain: All real #s
Range: $y \ge 1$

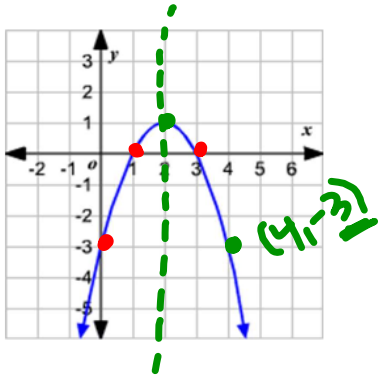


16. Fill in the number of real solutions for the graphs:

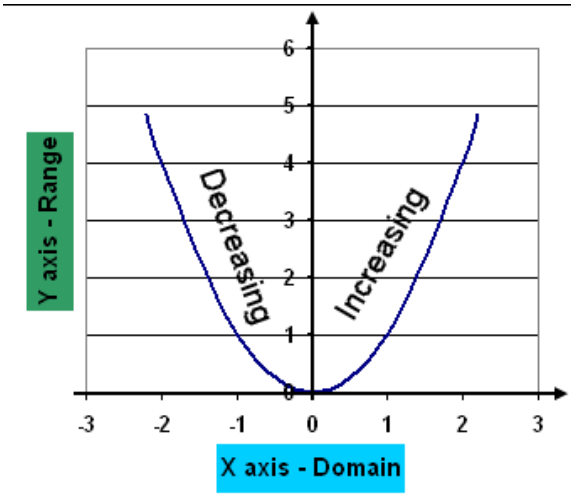
2 real solutions	1 (repeated) real solution	0 real solutions
		
two *x*-intercepts	one *x*-intercept	no *x*-intercepts

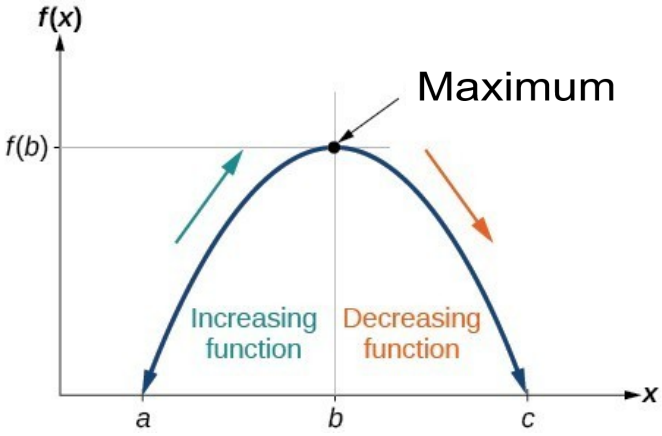
17. Find the following for the graph to the right:

Axis of Symmetry: $x = 2$
Min or Max: max
Vertex: (2, 1)
y intercept: -3 (0, −3)
Solutions: 3, 1 (1, 0) (3, 0) (x-int)
Evaluate $f(4)$ $= -3$

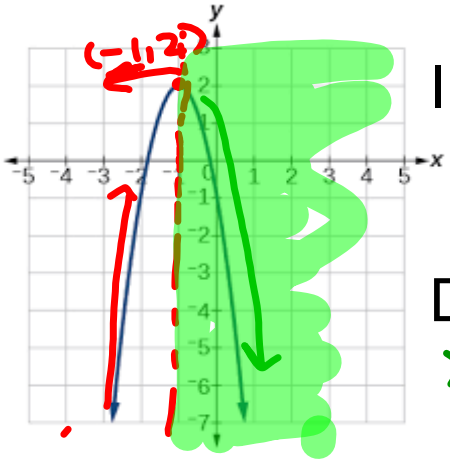


We can identify where a graph is increasing or decreasing...



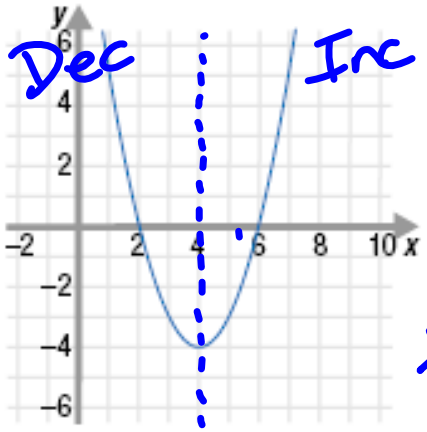


Determine where the function is increasing and decreasing



Inc: $x<-1$

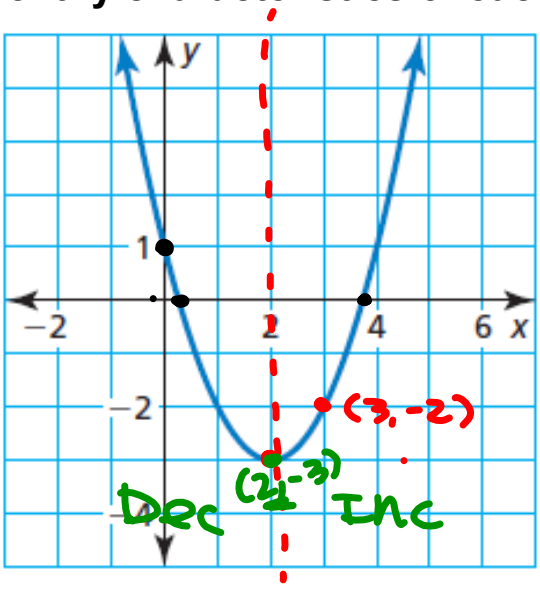
Dec: $x>-1$



Inc: $x>4$

Dec: $x<4$

Identify characteristics of each quadratic function and its graph.



Vertex: (2, -3)

Axis of Symmetry: x = 2

Increasing: x > 2

Decreasing: x < 2

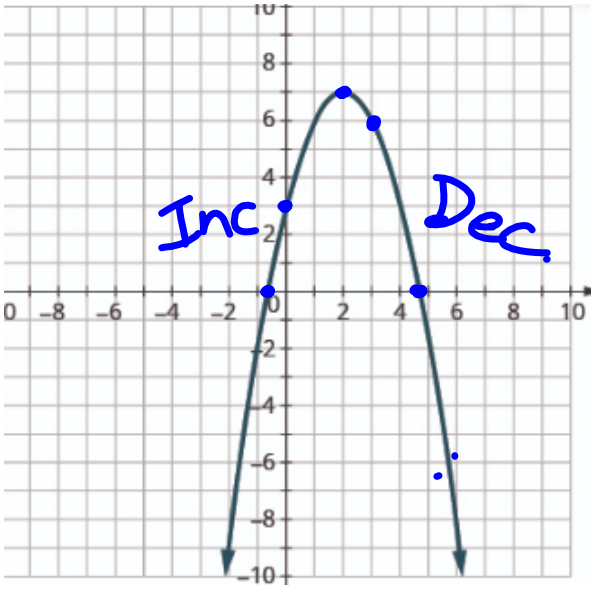
Min or Max: min

y-intercept: 1

x-intercept(s): .3 3.75

Find f(3): −2

Identify characteristics of each quadratic function and its graph.



Vertex: (2, 7)

Axis of Symmetry: $x = 2$

Increasing: $x < 2$

Decreasing: $x > 2$

Min or Max: Maximum

y-intercept: (0, 3)

x-intercept(s): $-.75, 4.75$

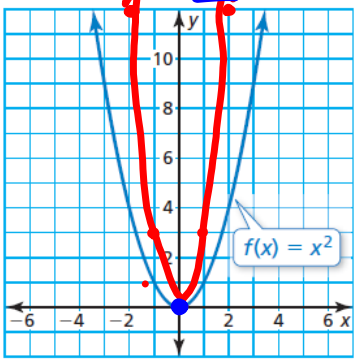
Find f(3): 6

Graph the quadratic function $g(x) = 3x^2$

Compare g(x) to the parent function $f(x) = x^2$

SHOW HOW TO GRAPH ON CALC

$g(x) = 3x^2$



x	y
−3	27
−2	12
−1	3
0	0
1	3
2	12
3	27

from vertex:

out 1 , up $1 \cdot 3 = 3$

out 2 , up $4 \cdot 3 = 12$

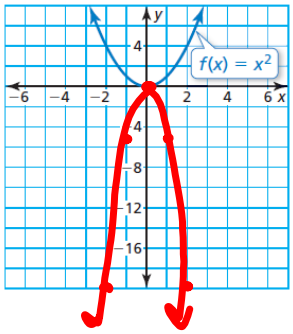
out 3 , up $9 \cdot 3 = 27$

$y = ax^2$ mult "up" by "a" value

How did "a" affect the graph?

Graph each quadratic function using your pattern

$g(x) = -5x^2$



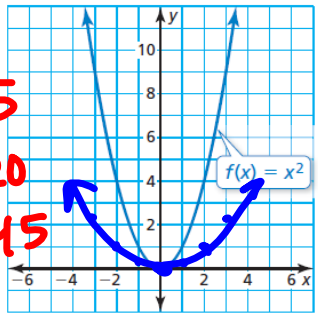
from vertex:

out 1, up 1(-5) -5

out 2, up 4(-6) -20

out 3, up 9(-5) -45

$g(x) = \frac{1}{4}x^2$



from vertex:

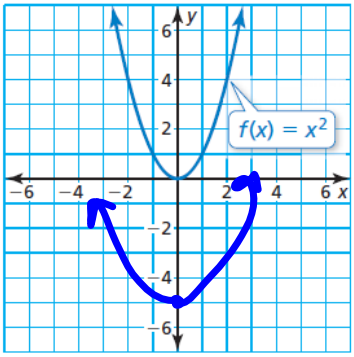
out 1, up 1(¼) = ¼

out 2, up 4(¼) = 1

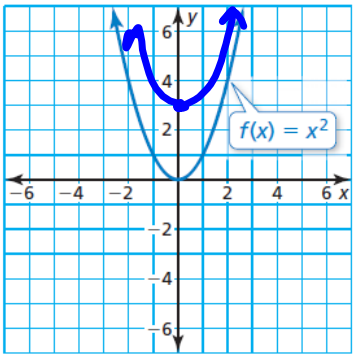
out 3, up 9(¼) = 2¼

Graph the function. Compare the graph to the graph of $f(x) = x^2$.

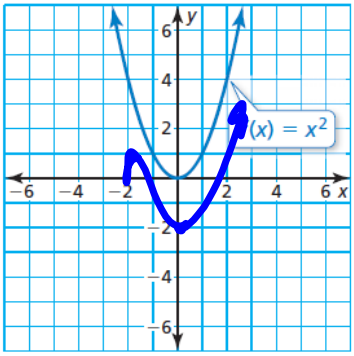
1. $g(x) = x^2 - 5$



2. $h(x) = x^2 + 3$



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



Describe the transformations done to the parents function $f(x) = x^2$.

a. $g(x) = 5x^2 + 1$

stretch ↑ 1

1.5

b. $h(x) = \frac{1}{3}x^2$ compress

c. $n(x) = \frac{3}{2}x^2 + 2$

stretch ↑ 2

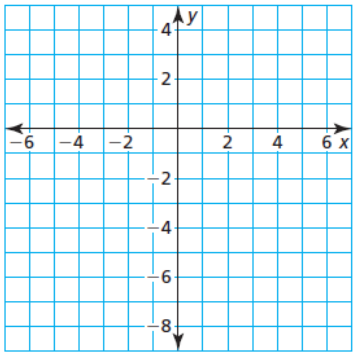
d. $p(x) = -3x^2 - 5$

reflect over x-axis

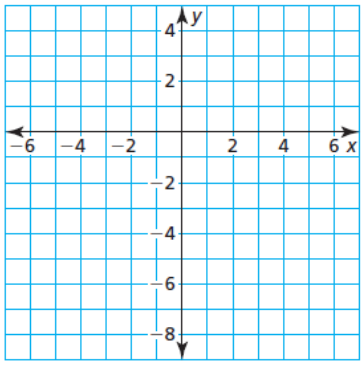
stretch ↓ 5

Graph each function. Find the x-intercepts of the graph. Explain how you found the x-intercepts (roots).

a. $y = x^2 - 9$

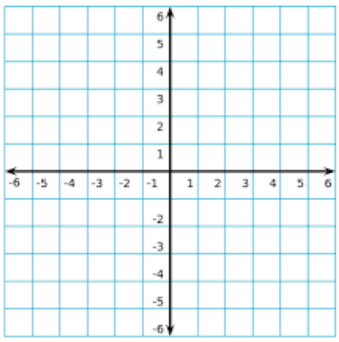


b. $y = -x^2 + 1$



Let $f(x) = -\frac{1}{2}x^2 + 2$ and $g(x) = f(x) - 7$.

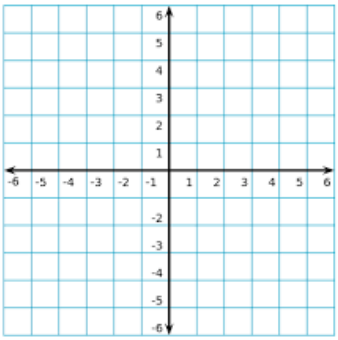
a. Describe the transformation from the graph of *f* to the graph of *g*. Then graph *f* and *g* in the same coordinate plane.



b. Write an equation that represents *g* in terms of *x*.

Let $f(x) = 3x^2 - 1$ and $g(x) = f(x) + 3$.

a. Describe the transformation from the graph of f to the graph of g. Then graph f and g in the same coordinate plane.



b. Write an equation that represents g in terms of x.

The function $h(t) = -16t^2 + 64$ represents the height (in feet) of a dropped object t seconds after being dropped.

a. Find the initial height of the object.

b. How many seconds will it take for the object to hit the ground?

c. Suppose the initial height is adjusted by k feet.
How will this affect the function $h(t)$?

d. Explain why only positive values of t are used.

3.1 and 3.2 hw

3.1 pg 127-128 #s 1, 2, 3-9 odd, 17, 26, 27

3.2 pg 133-134 #s 1, 2, 7-21 odd, 27, 38