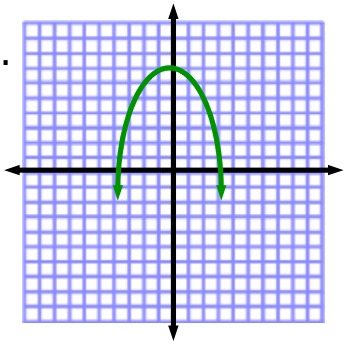
Warm-up 3-28

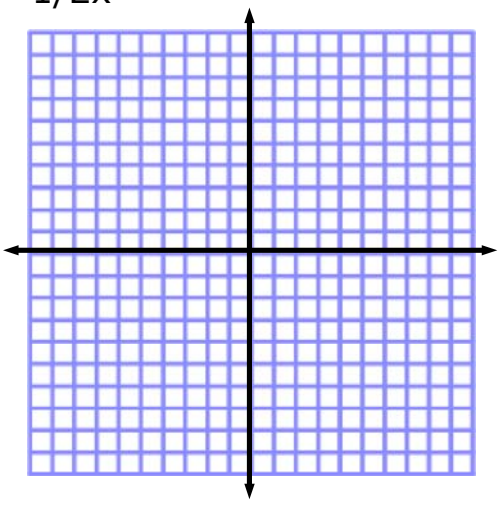
Determine if the following are quadratic functions. Explain. If it is quadratic, determine if it faces up or down.

1. $y = -x^2 + 3$

2. 

3. $y^2 = x + 3$

4. Use a table of values to graph $y = -1/2x^2$



Warm-up 3-28

Determine if the following are quadratic functions. Explain. If it is quadratic, determine if it faces up or down.

1. $y = -x^2 + 3$

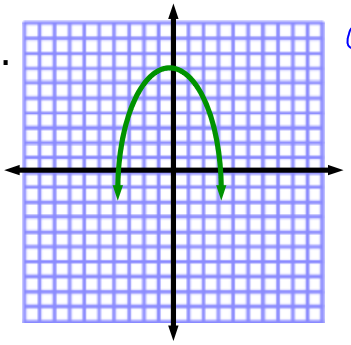
yes, it has an x^2

down

3. $y^2 = x + 3$

no, there is no x^2

2.



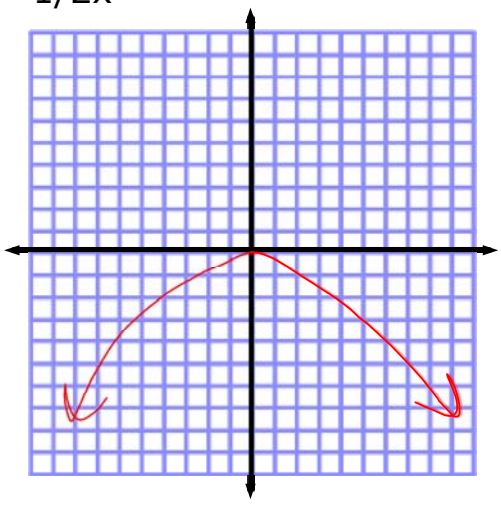
yes, it's a parabola

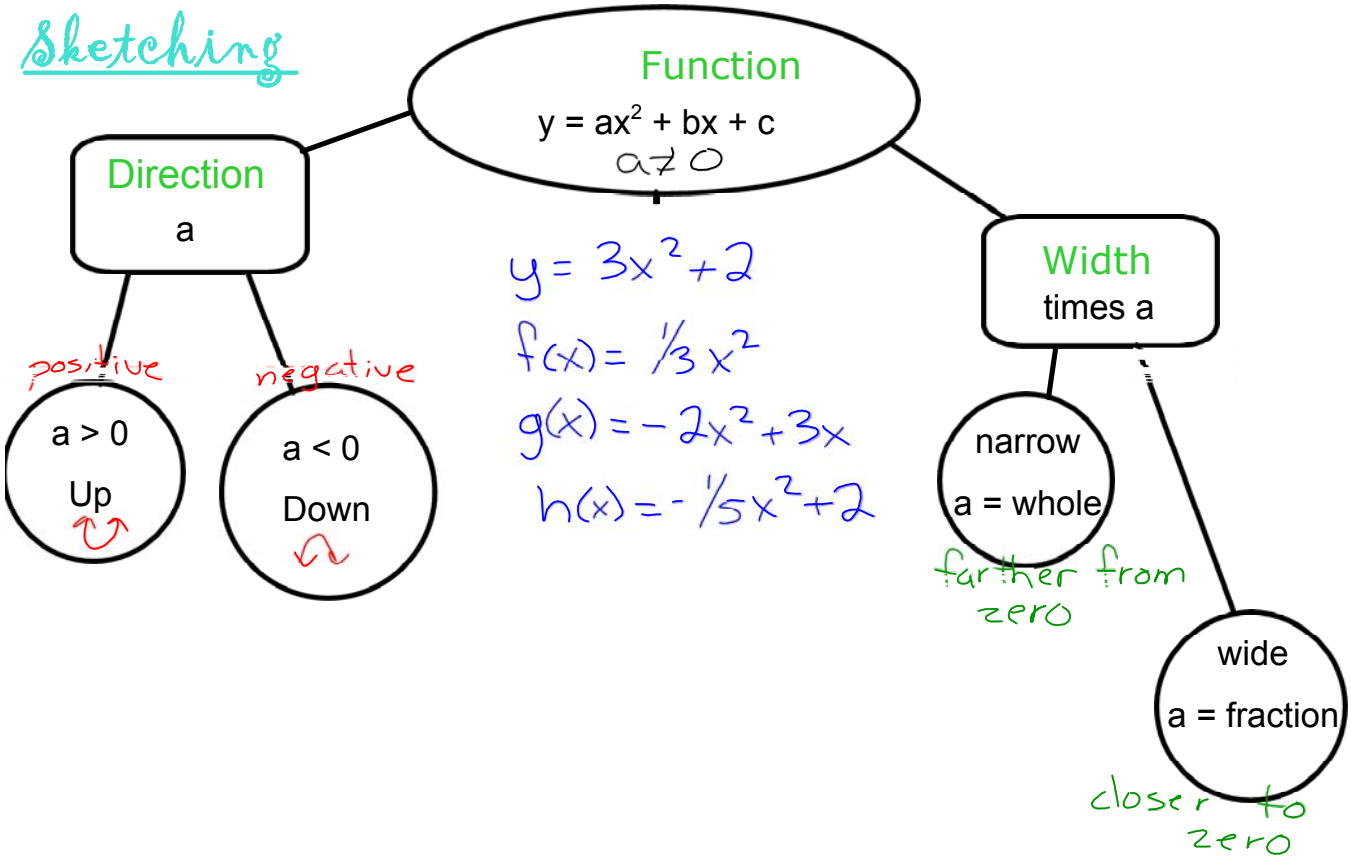
down

4. Use a table of values to graph $y = -1/2x^2$

x	y
-2	-2
-1	-½
0	0
1	-½
2	-2

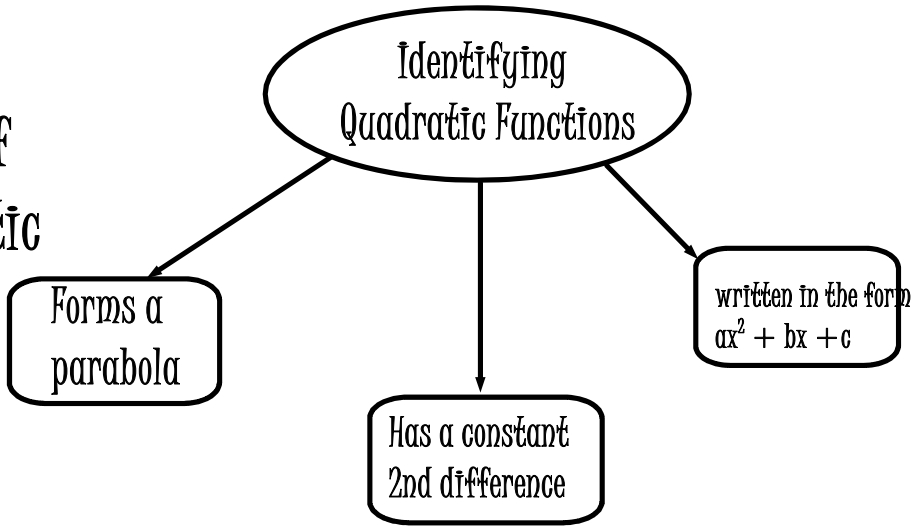
$y = -\frac{1}{2}(-2)^2$
$= -\frac{1}{2}(4)$
$= -2$




Sketching
Function
y = ax² + bx + c
a ≠ 0
Direction
a
positive
a > 0
Up
negative
a < 0
Down
y = 3x² + 2
f(x) = ⅓x²
g(x) = −2x² + 3x
h(x) = −⅕x² + 2
Width
times a
narrow
a = whole
farther from zero
wide
a = fraction
closer to zero

Review

Describe the ways of identifying quadratic functions



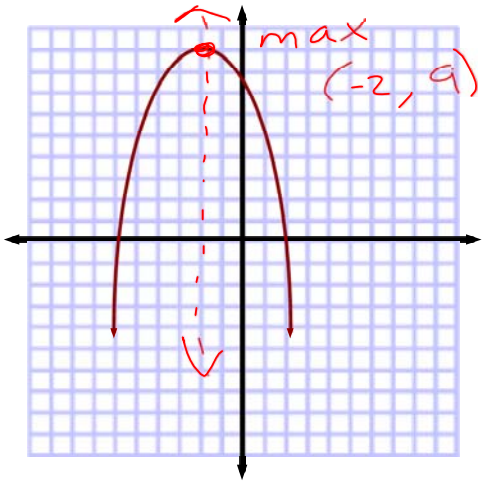
Today's Goals

I can...

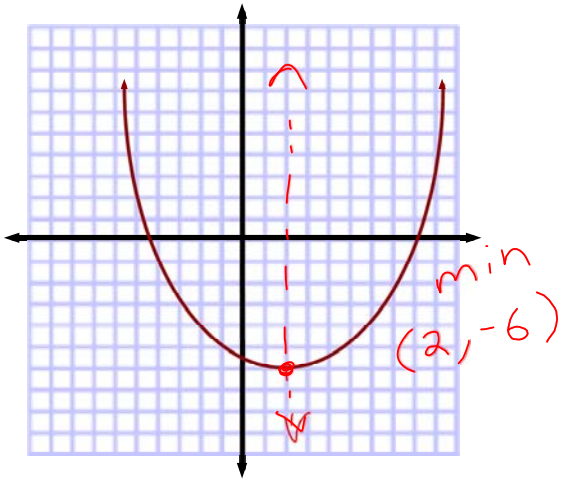
- find the vertex given a graph (max/min)
- determine appropriate domain/range
- find the zeros of a quadratic function from its graph

Maximum and Minimum Values

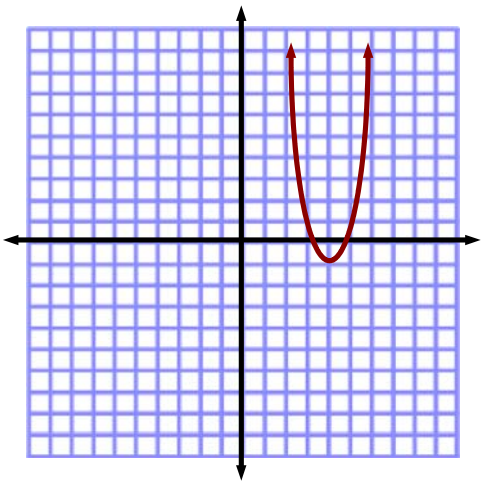
Vertex-the point where the parabola crosses its axis of symmetry (max or min)

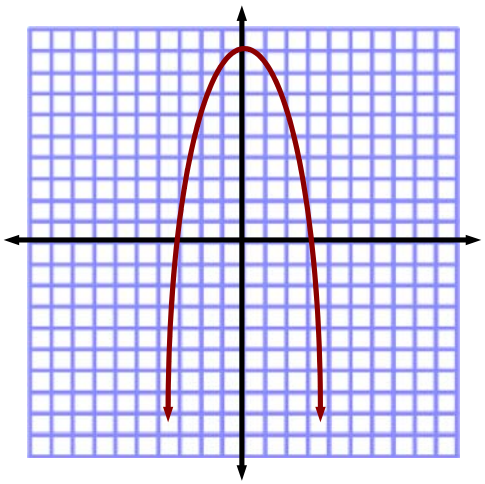


Vertex

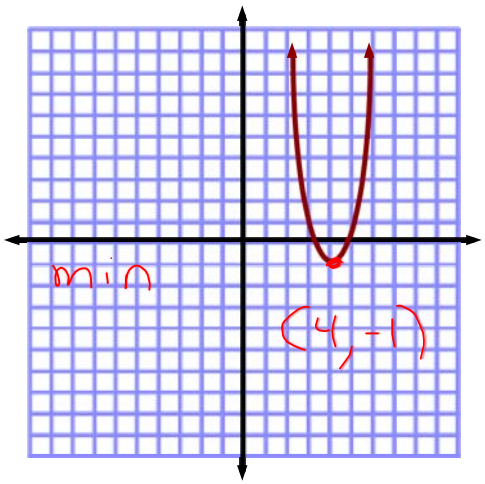


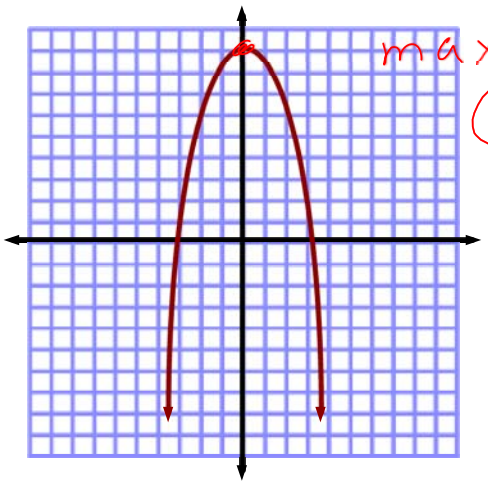
Identify the vertex of each parabola. Then, give the minimum or maximum value of the function.





Identify the vertex of each parabola. Then, give the minimum or maximum value of the function.

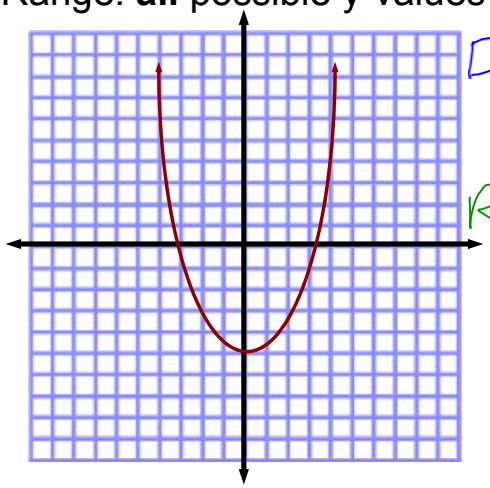




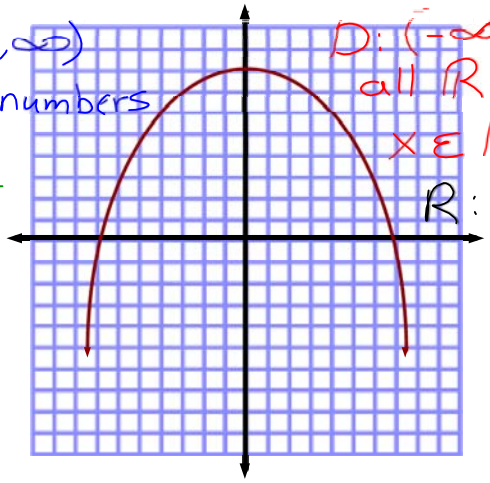
Domain and Range

Domain: **all** possible x-values

Range: **all** possible y-values



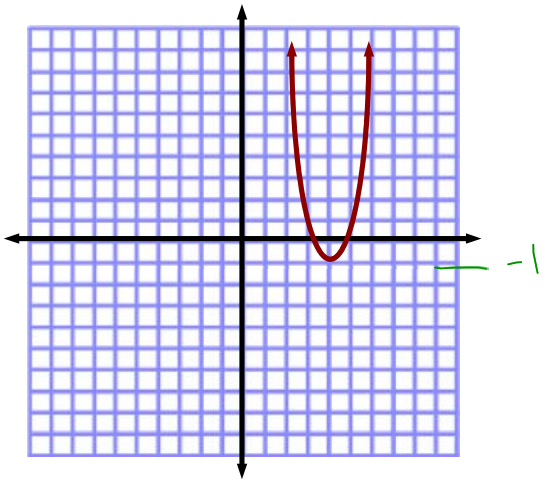
$D: (-\infty, \infty)$
all $\mathbb{R}$ numbers
$x \in \mathbb{R}$
$R: y > -5$



$D: (-\infty, \infty)$
all $\mathbb{R}$ numbers
$x \in \mathbb{R}$
$R: y \leq 8$

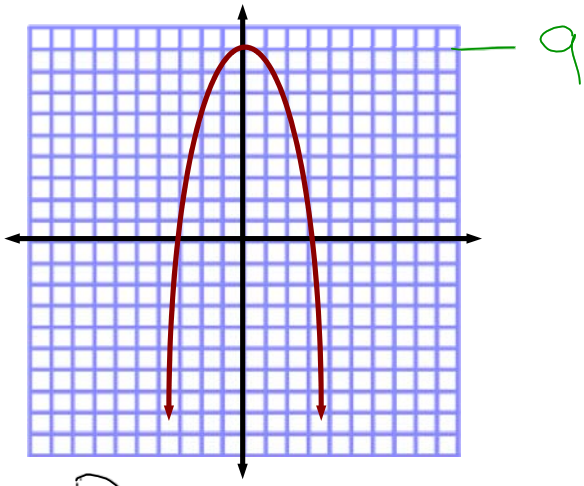
Try These!!

Determine the domain and range of the functions depicted on the graphs below.



D:

R:

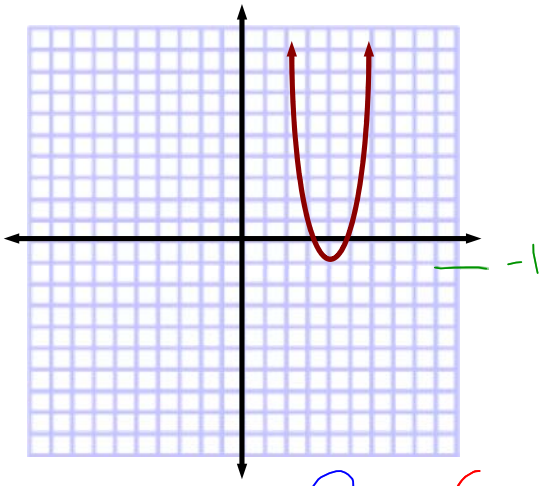


D:

R:

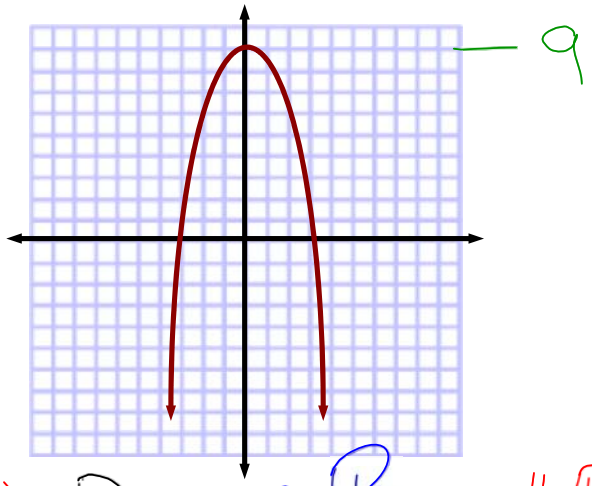
Try These!!

Determine the domain and range of the functions depicted on the graphs below.



D: $x \in \mathbb{R}$ or $(-\infty, \infty)$

R: $y \geq -1$



D: $x \in \mathbb{R}$ or all $\mathbb{R}$ #'s

R: $y \leq 9$

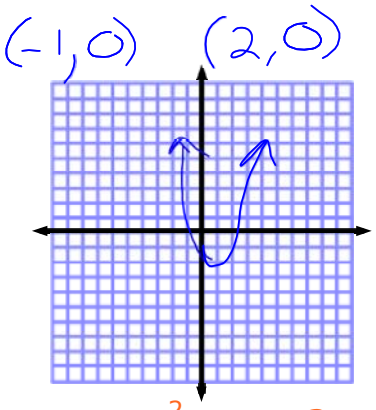
Section 10.2: Characteristics of a Quadratic Function

Think back.....

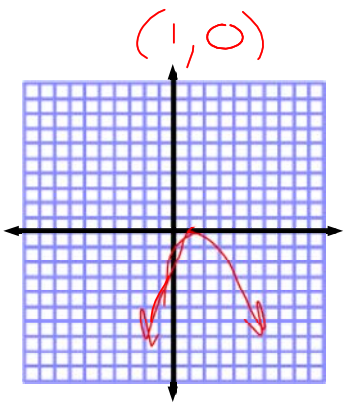
x-intercept -where the graph crosses the x-axis (the y-value is always 0; (x, 0)

Zero of a function:

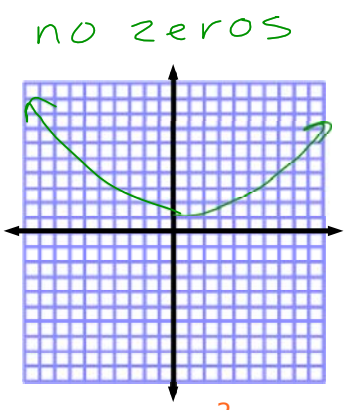
Zeros: x-intercepts; where the graph (parabola) crosses the x-axis



$y = x^2 - x - 2$



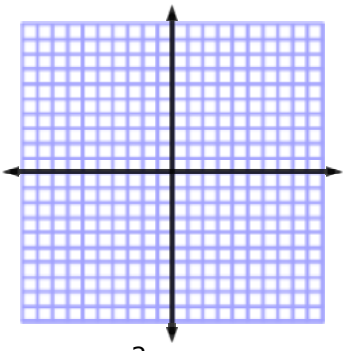
$y = -2x^2 + 4x - 2$



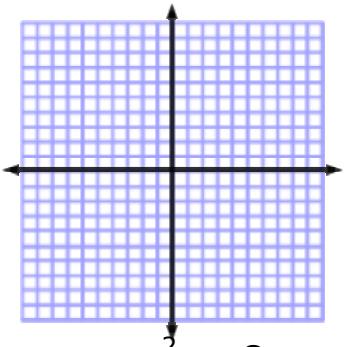
$y = 1/4x^2 + 1$

Try These!!

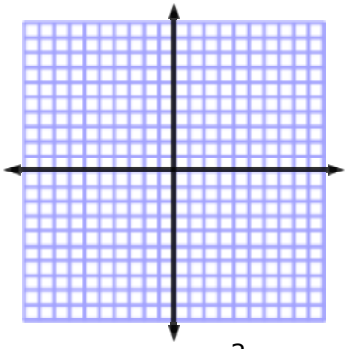
Find the zeros of each quadratic function from its graph.
Check your answer.



$y = x^2 - 2x - 3$



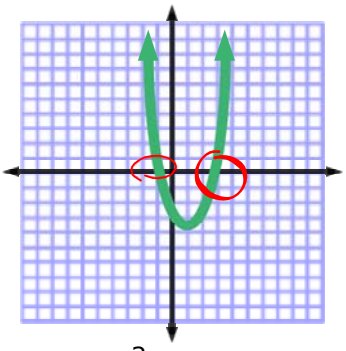
$y = x^2 + 8x + 16$



$y = -2x^2 - 2$

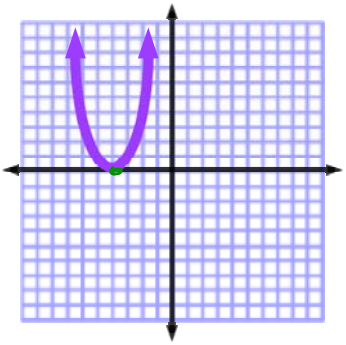
Try These!!

Find the zeros of each quadratic function from its graph.
Check your answer.



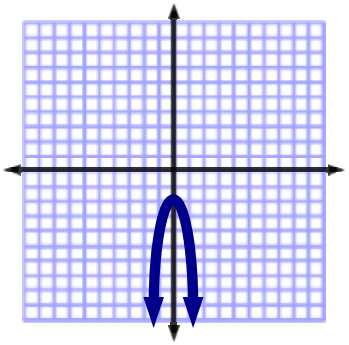
$y = x^2 - 2x - 3$

(3,0) (-1,0)



$y = x^2 + 8x + 16$

(-4,0)



$y = -2x^2 - 2$

none

USATestPrep

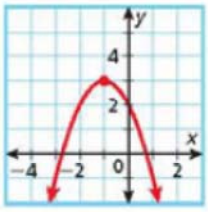
Project:

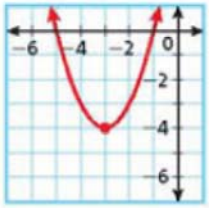
- Each unit should be on a new 1/2 page
  - > there are 9 units
  - > each unit should have definitions and examples
- Be sure to have all major concepts from each unit
- This will be graded hard, but you have over a month to be working on it
- Be creative and show your style on your project

Homework

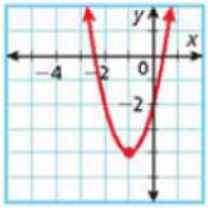
pg. 526 #17-29 (odd)

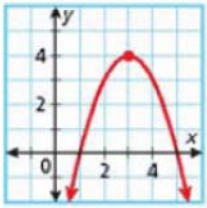
SEE EXAMPLE 4 Identify the vertex of each parabola. Then give the minimum or maximum value of the function.

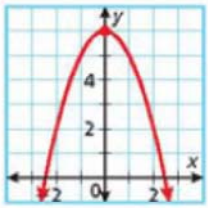
16. 

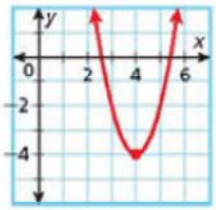
17. 

SEE EXAMPLE 5 Find the domain and range.

18. 

19. 

20. 

21. 

PRACTICE AND PROBLEM SOLVING

Independent Practice

For Exercises	See Example
22–25	1
26–29	2
30–32	3
33–34	4
35–38	5

Extra Practice

See Extra Practice for more Skills Practice and Applications Practice exercises.

Tell whether each function is quadratic. Explain.

22.

x	−2	−1	0	1	2
y	−1	0	4	9	15

23. $-3x^2 + x = y - 11$

24. $\{(0, -3), (1, -2), (2, 1), (3, 6), (4, 13)\}$

25. $y = \frac{2}{3}x - \frac{4}{9} + \frac{1}{6}x^2$

Use a table of values to graph each quadratic function.

26. $y = x^2 - 5$

27. $y = -\frac{1}{2}x^2$

28. $y = -2x^2 + 2$

29. $y = 3x^2 - 2$

Tell whether the graph of each quadratic function opens upward or downward. Explain.

30. $y = 7x^2 - 4x$

31. $x - 3x^2 + y = 5$

32. $y = -\frac{2}{3}x^2$