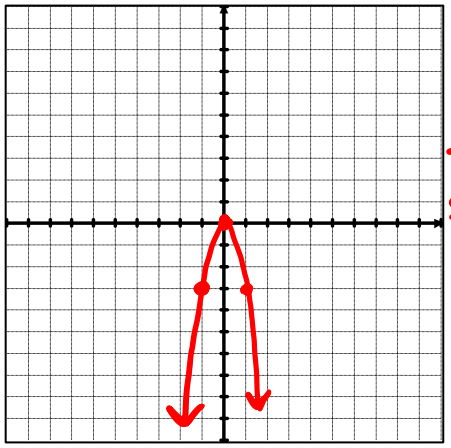
Algebra 1 Name Key

Unit 8 Day 6: Quadratics Graphing Review

For #1-2 graph the following:

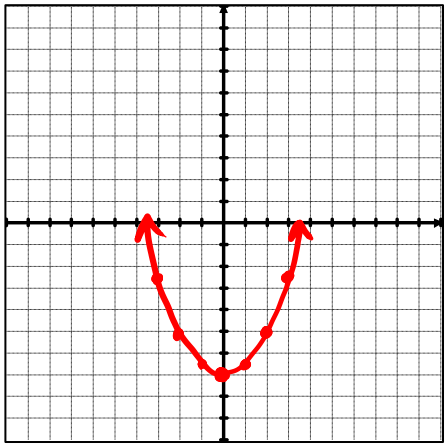
1. $y = -3x^2$ vertex (0,0)



Pattern

1 → -3
3 → -9
5 → -15

2. $y = \frac{1}{2}x^2 - 7$ vertex (0,-7)

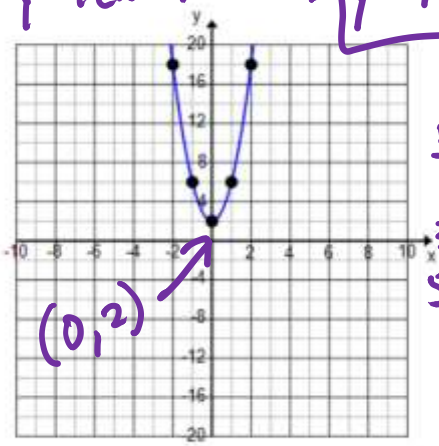


Pattern

1 → 1/2
3 → 3/2
5 → 5/2

For #3-5, write the equation of the graph shown.

3. $y = 4(x-0)^2 + 2 \rightarrow \boxed{y = 4x^2 + 2}$

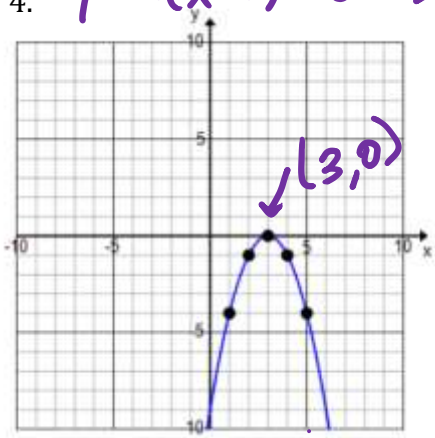


Pattern

1 → 4
3 → 12
5

$\boxed{\times 4}$

4. $y = -1(x-3)^2 + 0 \rightarrow \boxed{y = -(x-3)^2}$

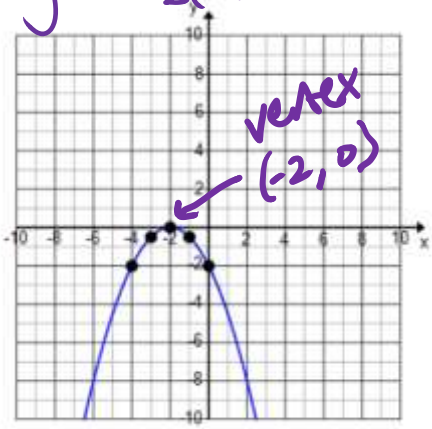


Pattern

1 → -1
3 → -3
5 → -5

$\boxed{\times -1}$

5. $y = -\frac{1}{2}(x+2)^2 + 0 \rightarrow \boxed{y = -\frac{1}{2}(x+2)^2}$



Pattern

1 → -1/2
3 → -3/2
5 → -5/2

$\boxed{\times -\frac{1}{2}}$

For #6-7 state the vertex, axis of symmetry, and whether the graph opens up or down.

6. $y = -4(x+8)^2 - 3$

vertex: $(-8,-3)$

a.o.s.: $x = -8$

$a < 0$ opens ↓

7. $y = x^2 + 10x + 15$

$x = -\frac{10}{2(1)} = -5$

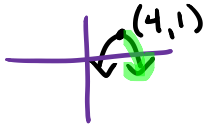
$y = (-5)^2 + 10(-5) + 15$

$= 25 - 50 + 15 = -10$

vertex: $(-5,-10)$ opens ↑

a.o.s.: $x = -5$

8. On what interval is $f(x) = -(x-4)^2 + 1$ decreasing?



decreasing on $[4, \infty)$

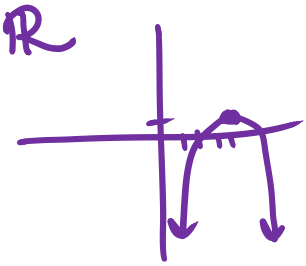
9. What is the domain and range of $f(x) = -(x-4)^2 + 1$?

D: $(-\infty, \infty)$ OR $\mathbb{R}$

R: $(-\infty, 1]$

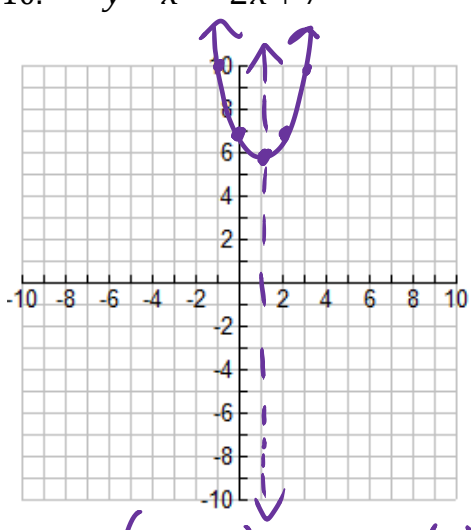
OR

$y \le 1$



For #10-11, graph the following using at least five accurate points. Identify the vertex, axis of symmetry, and y-intercept.

10. $y = x^2 - 2x + 7$



Vertex $(1,6)$ $x = \frac{-(-2)}{2(1)} = 1$

A.O.S. $x = 1$ $y = (1)^2 - 2(1) + 7$

$y = 1 - 2 + 7 = 6$

y-intercept $(0,7)$ → sym pt. $(2,7)$

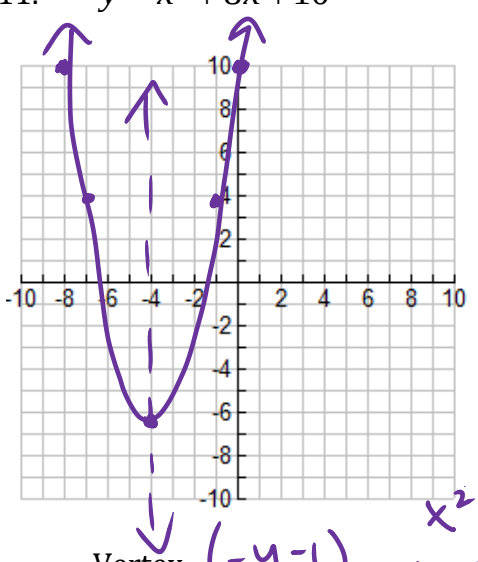
Pt. $(3,10)$ $x = 3$ $y = (3)^2 - 2(3) + 7$

$= 9 - 6 + 7 = 10$

↓

sym pt. $(-1,10)$

11. $y = x^2 + 8x + 10$



Vertex $(-4,-6)$ $x^2 + 8x + 10$

$x = -\frac{8}{2(1)} = -4$

$(-4)^2 + 8(-4) + 10$

$16 - 32 + 10 = -6$

A.O.S. $x = -4$

y-intercept $(0,10)$ → sym. pt. $(-8,10)$

Pt. $(-1,3)$ → sym pt. $(-7,3)$

$x = -1$ $(1)^2 + 8(-1) + 10$

$1 - 8 + 10 = 3$

For #12-13, what transformation(s) take place on $f(x)=x^2$ to get g(x)?

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

right 5

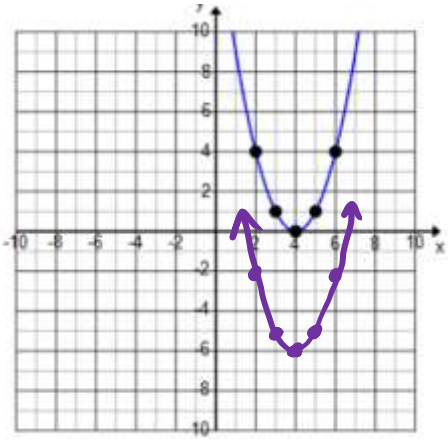
13. $g(x)=-(x)^2+4$

reflection over x-axis

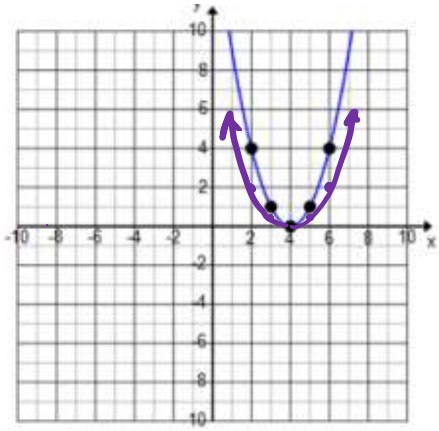
up 4

For #14-15, <u>the graph of f(x) is shown</u>, graph g(x) on the same coordinate plane.

14. $g(x)=f(x)-6$ down 6



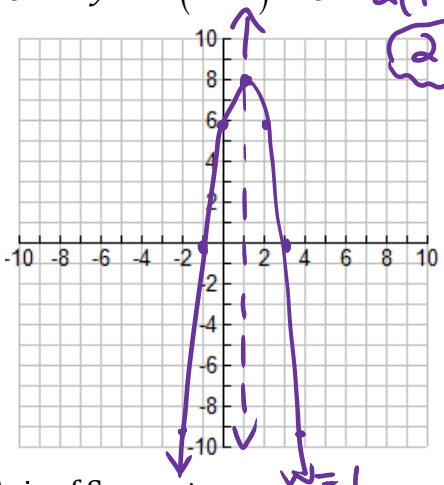
15. $g(x)=\frac{1}{2}f(x)$ vert shrink by 1/2



For #16-17, graph the following:

16. $y=-2(x-1)^2+8$ 2(1-3-5)

2-6-10



Axis of Symmetry: x=1

Vertex: (1,8) MAX or MIN

direction of graph: ∩

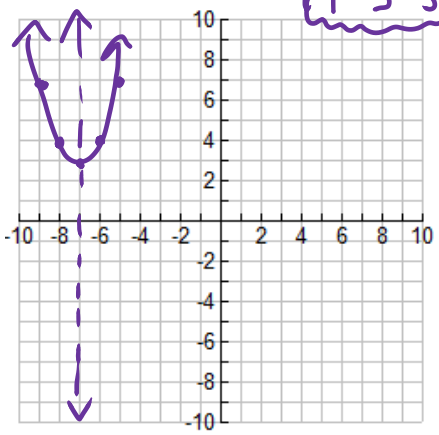
range: y≤8

End Behavior: $x \to -\infty$, $y \to$ -∞
$x \to \infty$, $y \to$ -∞

Increasing interval: (-∞,1]

Decreasing interval: [1,∞)

17. $y=(x+7)^2+3$ 1-3-5



Axis of Symmetry: x=-7

Vertex: (-7,3) MAX or MIN

direction of graph: ∪

range: y≥3

End Behavior: $x \to -\infty$, $y \to$ ∞
$x \to \infty$, $y \to$ ∞

Increasing interval: [-7,∞)

Decreasing interval: [-∞,-7]