Algebra 1 **8.2 Notes**

Transformed Quadratic Function: $f(x) = a(x-h)^2 + k$

a: vertical dilation

-a: reflected over xaxis

x + h: translated left

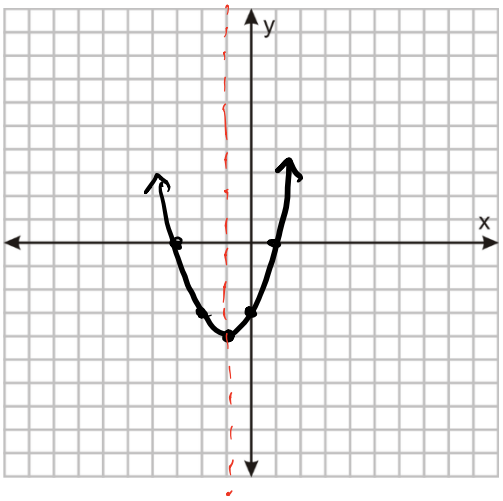
x – h: translated right

+ k : translated up

-k: translated down

Sketch each parabola. Then state the vertex, axis of symmetry, domain and range.

1) $f(x) = (x+1)^2 - 4$



over	up
1	1
2	4

Description: Translated left 1 and down 4

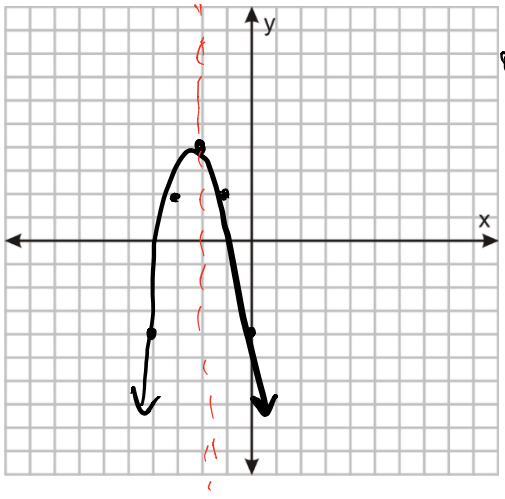
Vertex: $(-1, -4)$

Axis of Symmetry: $x = -1$

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

Range: $y \in [-4, \infty)$

2) $f(x) = -2(x+2)^2 + 4$



over	up
1	$1 \cdot 2 = 2$
2	$4 \cdot 2 = 8$

Description: Reflected over xaxis, vertical dilation of 2 translated left 2, up 4

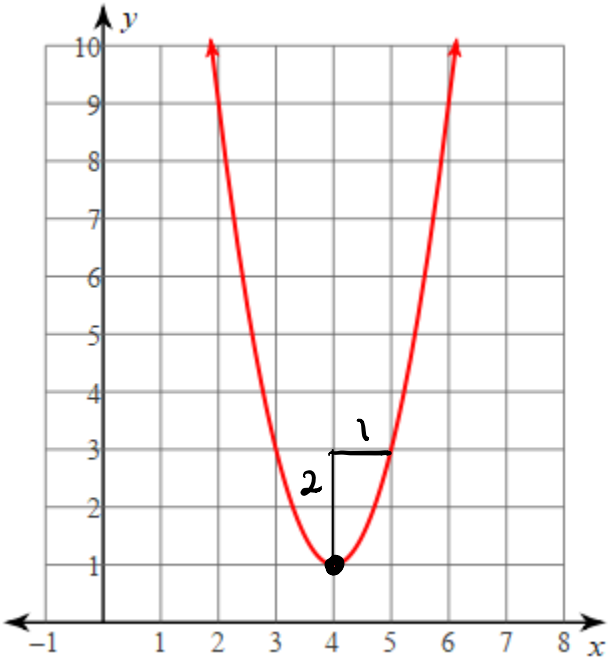
Vertex: $(-2, 4)$

Axis of Symmetry: $x = -2$

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

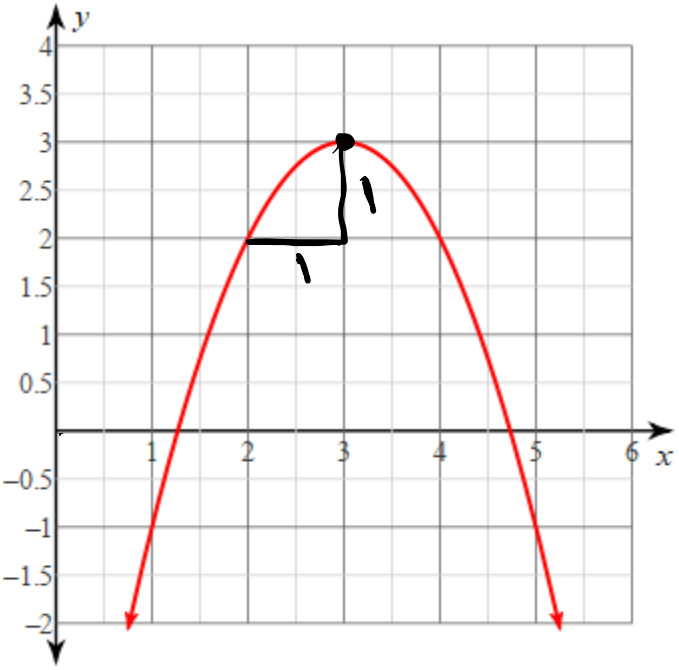
Range: $y \in (-\infty, 4]$

Write the equations of the parabolas.



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

$y = 2(x-4)^2 + 1$



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

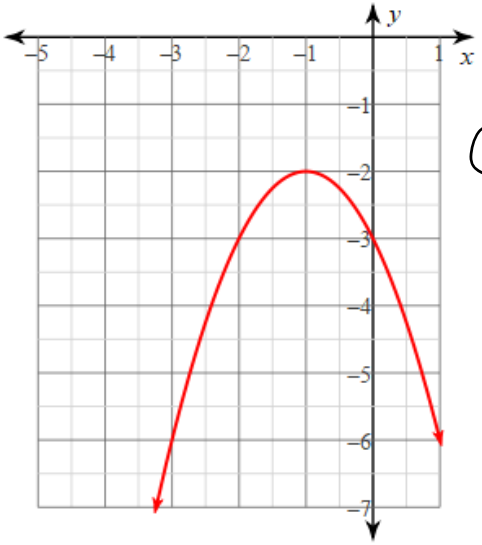
$y = -(x-3)^2 + 3$

or

$y = -1(x-3)^2 + 3$

You Try!

1) Pick the equation that matches the graph.



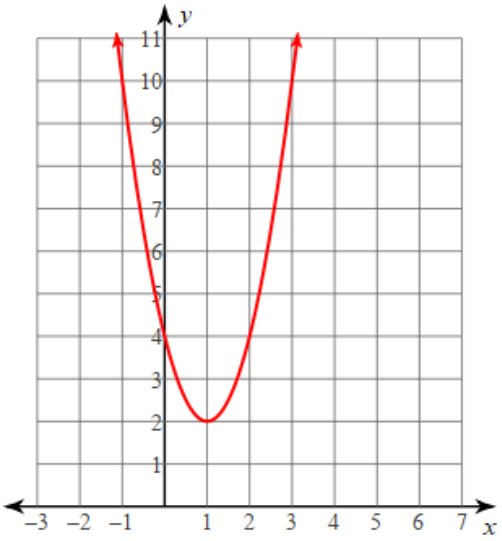
a) $f(x)=(x+1)^2-2$

b) $f(x)=-(x+1)^2-2$

c) $f(x)=-(x-1)^2-2$

d) $f(x)=-(x+1)^2+2$

2) Write an equation for the graph below.



$y=2(x-1)^2+2$

3) Describe the transformations from the parent function that make this graph: $f(x)=-3(x-2)^2+4$

Reflected over xaxis
vertical dilation of 3
translated right 2, up 4