

Warm up

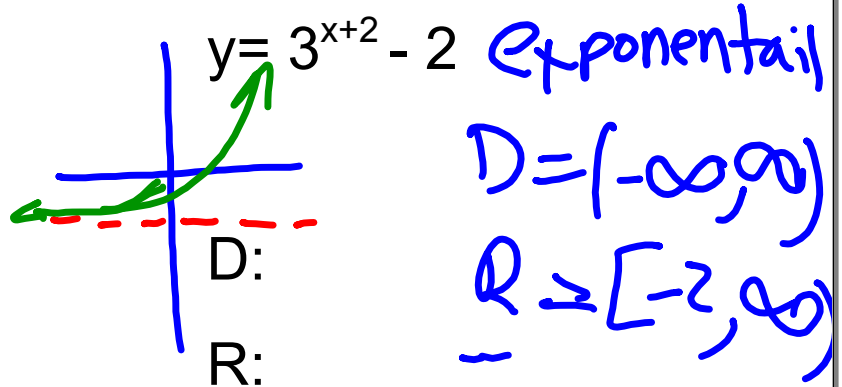
Label quadratic, linear or exponential. Identify the Domain and range.

$$y = 7x + 4$$

linear

$$D: (-\infty, \infty)$$

$$R: (-\infty, \infty)$$



Evaluate

$$f(x) = (x + 6)^2 - 1; \text{ Find } f(-7) \quad x=0$$

Quiz

Evaluate each function

1) $f(n) = n^2$; Find $f(-3)$

$$(-3)^2 = 9$$

2) $g(t) = -2t^2 + 3$; Find $g(0)$

$$-2(0)^2 + 3$$

$$-2(0) + 3 = 3$$

Transformations

Objectives:

- I can identify transformation from an equation and graph
- I can graph a transformed parent function

Domain changes

Range changes

$$y = \pm af(\pm b(x \pm h)) \pm k$$

$$y = x^2 + 2$$

★

	Vertical	Horizontal
Shift	$f(x) \pm k$	$f(x \pm h)$
Stretch/Compress	$af(x)$	$f(bx)$
Reflection	$-f(x)$	$f(-x)$

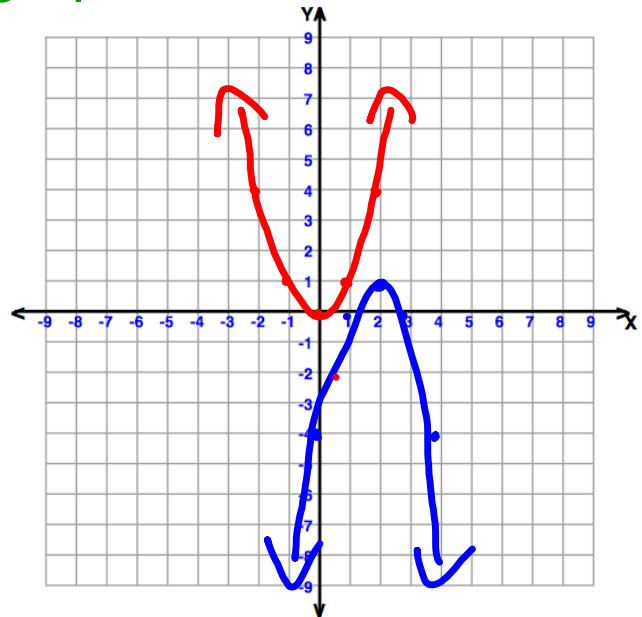
*Teacher note: [desmos.com](https://www.desmos.com)

State the parent function and identify the transformations and graph

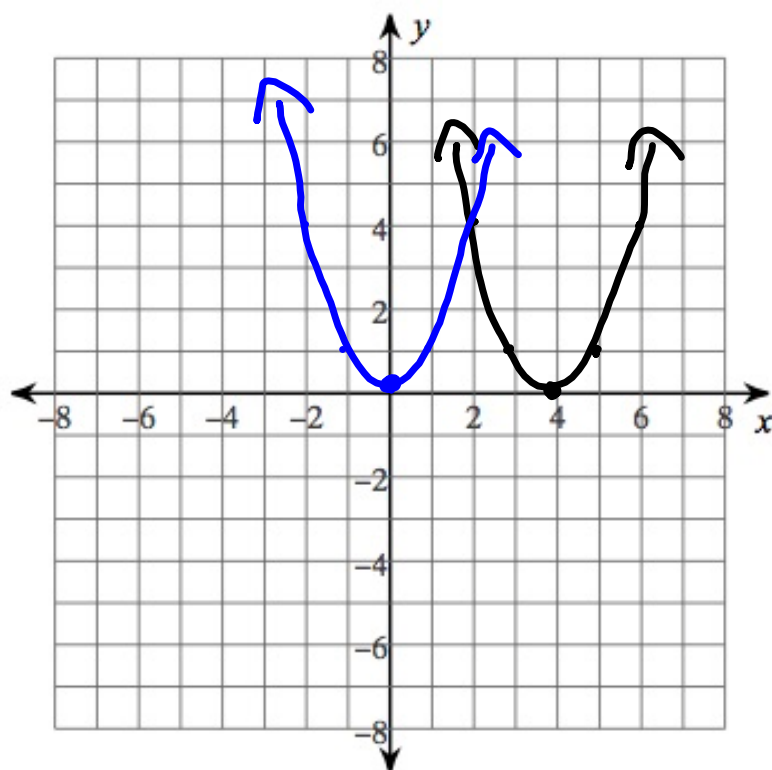
$$y = -1(x-2)^2 + 1$$

$$* y = x^2 \quad v: (2, 1)$$

shift \uparrow 1
 shift \rightarrow 2
 reflection



$$1) f(x) = (x - 4)^2 \rightarrow 0$$

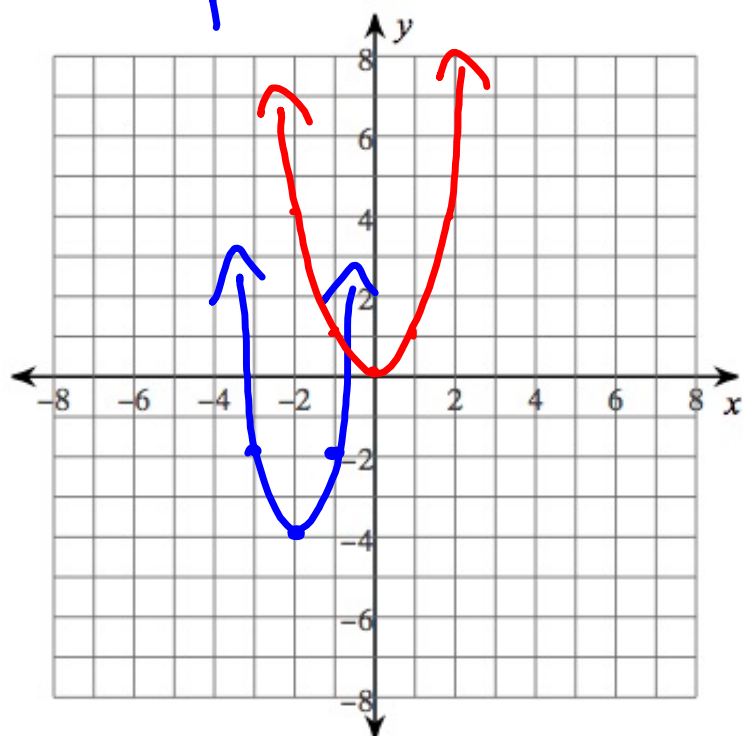


$$v: (4, 0)$$

$$y = x^2$$

Shift right 4

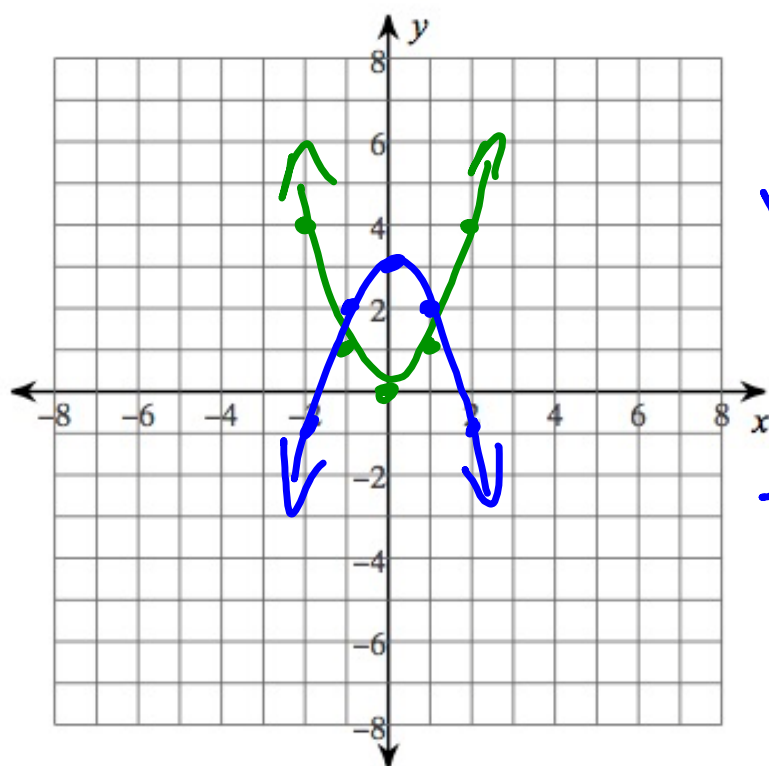
$$2) f(x) = 2(x + 2)^2 - 4$$



$$V: (-2, -4)$$

Shift down 4
Shift left 2
Stretch 2

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



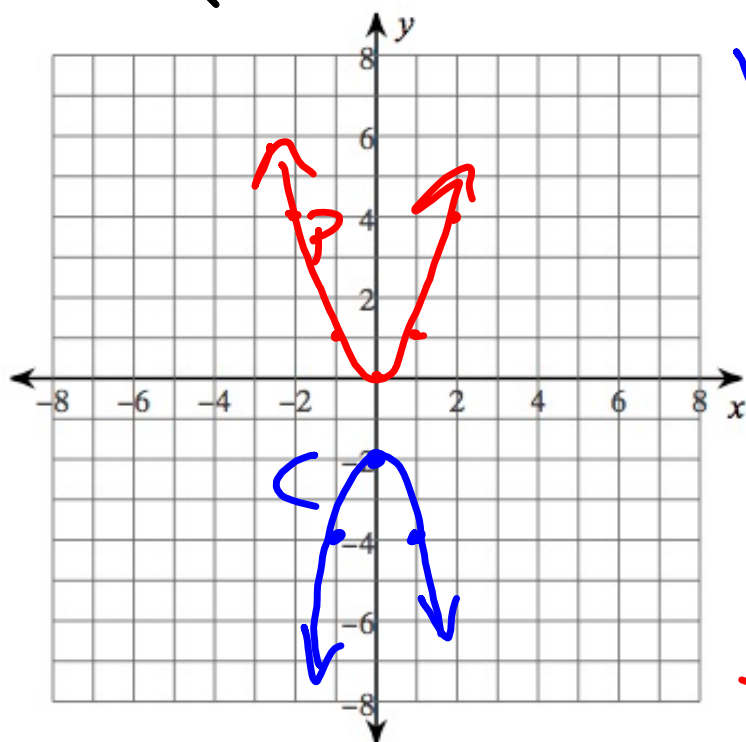
$$y = x^2$$

$$V: (0, 3)$$

UP 3

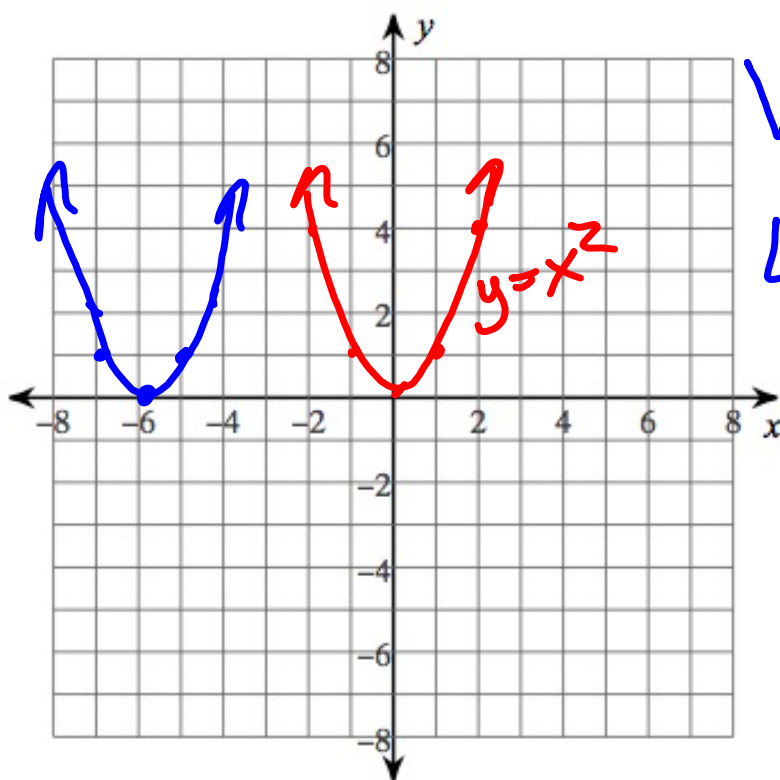
Reflected

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



left/right
 ↓
 V: 0 -2
 Reflect! ↑
 Slope: -2 up/down
 ↓ s ≠ 1
 down 2
 Reflect
 Stretch: 2

$$f(x) = (x+6)^2$$

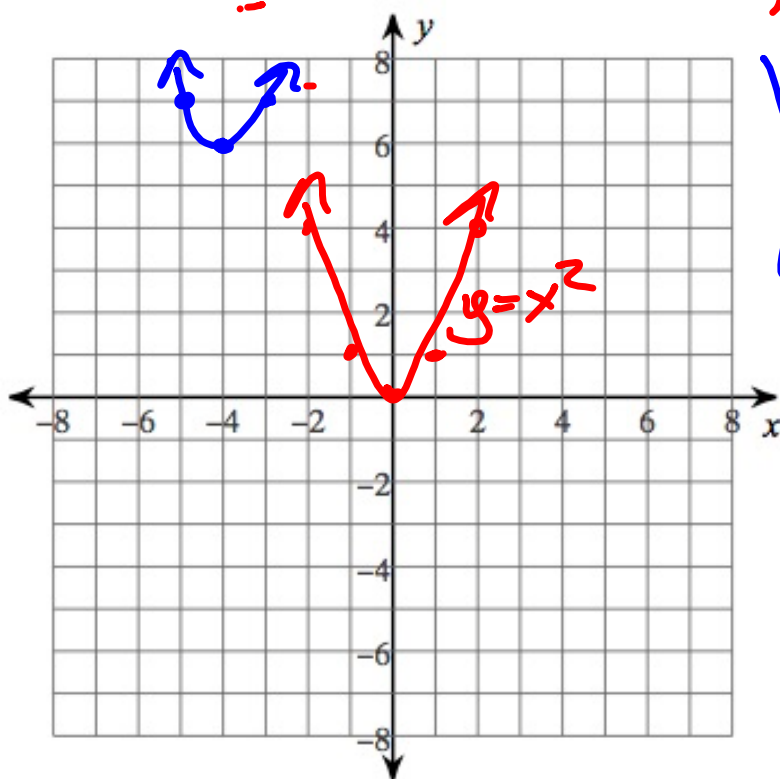


$$V = (-6, 0)$$

Left 6

$$\text{Slope} = 1$$

$$\underline{f(x) = (x + 4)^2 + 6}$$



$$f(x) = (x + 4)^2 + 6$$

$$V: (-4, 6)$$

Left 4

UP 6

Slope = 1