

List the transformations that have been applied to the parent function resulting in the function  $g(x)$ .

1.  $g(x) = 2(x - 3)^3 + 4$

2.  $g(x) = -0.5(x + 1)^2 - 3$

3. What transformations were applied to the function

$f(x) = \sqrt{x - 3} + 2$  that resulted in the function  $g(x) = -\sqrt{x + 3}$ ?

4. Sketch the function  $f(x) = \sqrt{x - 3} + 2$ . State the domain and range.

## Objectives

Recognize standard and vertex form of a quadratic equation.

Put quadratic equations in standard and vertex form.

Factor quadratic equations in standard form

## Homework

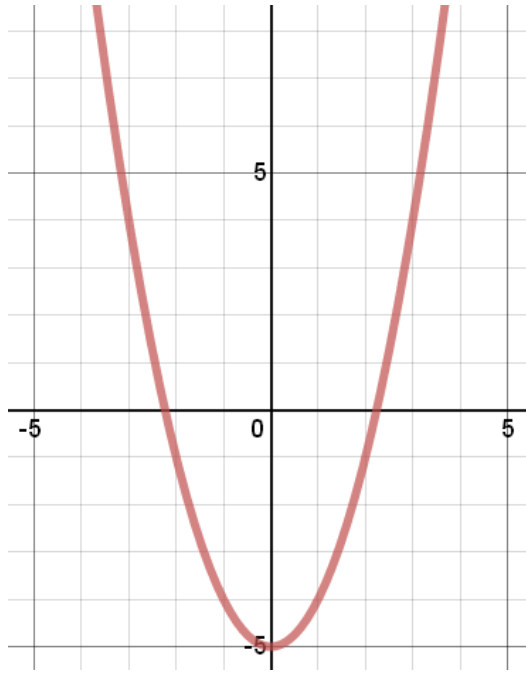
Packet Page 10

sections III and IV, all

sections I and II all the problems you haven't completed yet.

Packet Page 8 and 9 all

# Homework Questions?



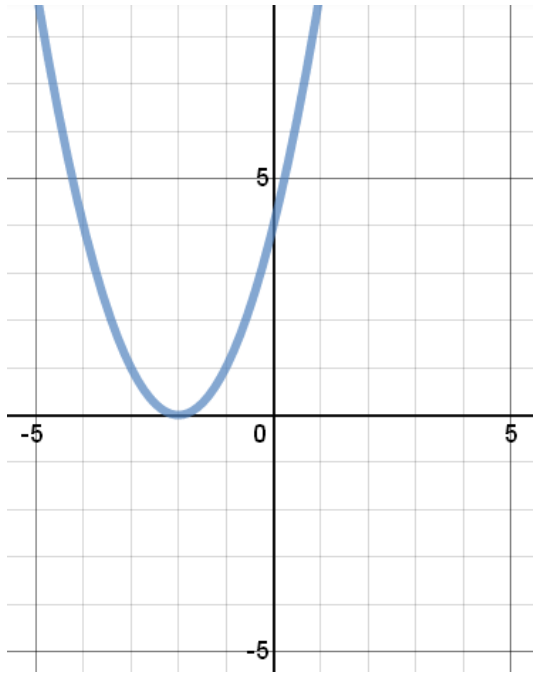
The **vertex form** of a quadratic function is

$$f(x) = \pm a(x - h)^2 + k$$

The **vertex** of the parabola is  $(h, k)$ , It's either the min or the max depending on which way the graph opens.

**Vertex:**  $(0, -5)$

**Function Equation:**  $f(x) = x^2 - 5$

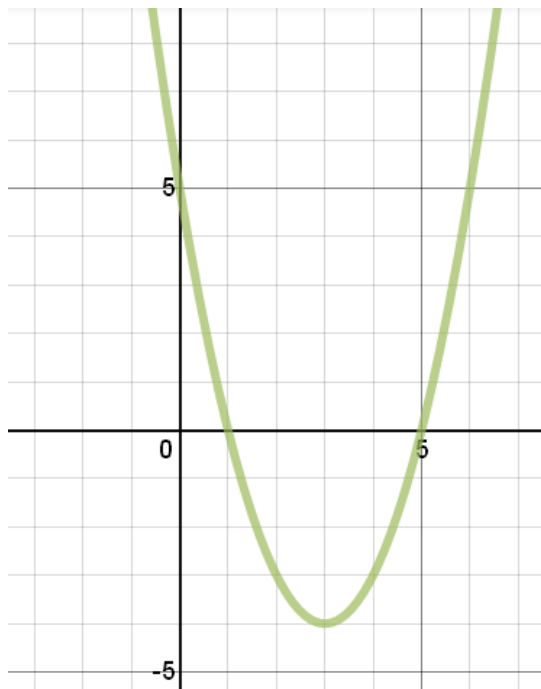


The **vertex form** of a quadratic function is

$$f(x) = \pm a(x - h)^2 + k$$

**Vertex:**  $(-2, 0)$

**Function Equation:**  $f(x) = (x + 2)^2$



The **vertex form** of a quadratic function is

$$f(x) = \pm a(x - h)^2 + k$$

**Vertex:**  $(3, -4)$

**Function Equation:**  $f(x) = (x - 3)^2 - 4$

The **standard form** of a quadratic function is

$$f(x) = ax^2 + bx + c$$

How can we put this equation in **vertex form**?

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

Use the fact that  $h = -\frac{b}{2a}$ .

Then evaluate the function at  $x = h$  or

$$k = f(h)$$

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

$$h = -\frac{-8}{2(2)} = 2$$

$$k = f(2)$$

$$k = 2(2)^2 - 8(2) + 1$$

$$k = -7$$

**Vertex is  $(2, -7)$        $f(x) = 2(x - 2)^2 - 7$**

**Put the equations in vertex form**

$$20. x^2 + 10x - 1 = 0$$

$$21. x^2 + 2x - 7 = 0$$

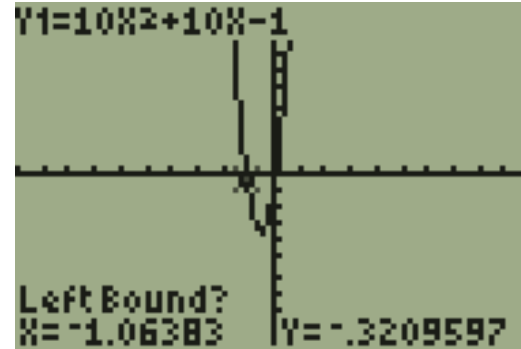


We can also use the calculator to put an equation in vertex form.

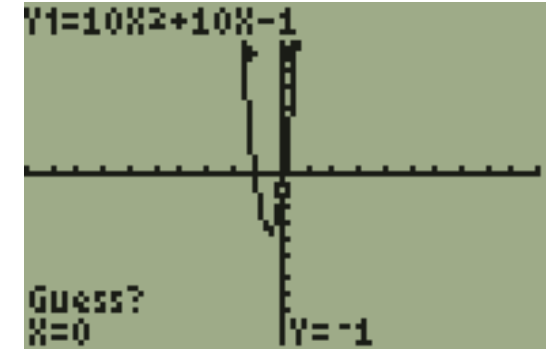
$$y = x^2 + 10x - 1$$

```
Plot1 Plot2 Plot3
Y1=10X^2+10X-1
Y2=
Y3=
Y4=
Y5=
Y6=
Y7=
```

Type your equation in y1



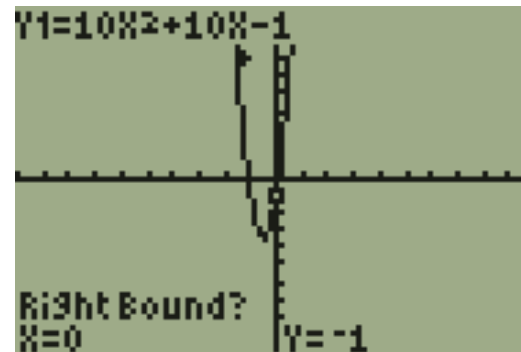
Move cursor to left of min  
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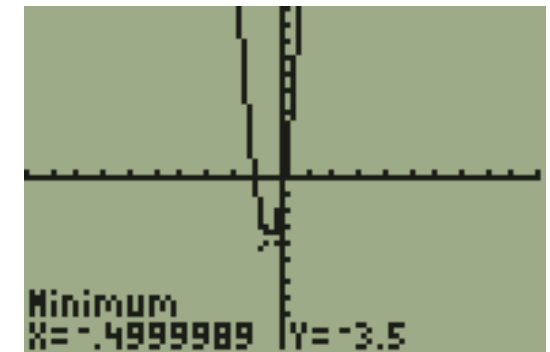
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```
CALCULATE
1:value
2:zero
3:minimum
4:maximum
5:intersect
6:dy/dx
7:∫f(x)dx
```

[2<sup>nd</sup>][TRACE][3:minimum]



Move cursor to right of min  
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Vertex (-.5, -3.5)


Convert any decimals to fractions.

$$y = \left(x + \frac{1}{2}\right)^2 - \frac{7}{2}$$

**Put the equations in vertex form using your calculator**

28.  $x^2 - 6x + 4 = 0$

24.  $3x^2 + 4x = 2x^2 + 3$



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