

Standard to Vertex Form day 2

Use the information provided to write the vertex form equation of each parabola.

1) $f(x) = 3x^2 + 24x + 42$

$$3(x^2 + 8x + 14)$$

$$3(x^2 + 8x + 16) - 16 + 14$$

$$f(x) = 3(x+4)^2 - 6$$

3) $f(x) = 2x^2 - 32x + 124$

$$2(x^2 - 16x + 62)$$

$$(x^2 - 16x + 64) - 64 + 62$$

$$f(x) = 2(x-8)^2 - 4$$

5) $f(x) = \frac{1}{2}x^2 - 8x + 42$

$$\frac{1}{2}(x^2 - 16x + 84)$$

$$(x^2 - 16x + 64) - 64 + 84$$

$$f(x) = \frac{1}{2}(x-8)^2 + 10$$

7) $f(x) = 2x^2 + 36x + 152$

$$2(x^2 + 18x + 76)$$

$$(x^2 + 18x + 81) - 81 + 76$$

$$f(x) = 2(x+9)^2 - 10$$

9) $f(x) = 2x^2 + 12x + 26$

$$2(x^2 + 6x + 13)$$

$$(x^2 + 6x + 9) - 9 + 13$$

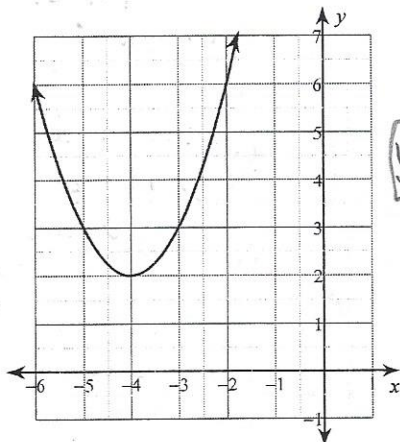
$$f(x) = 2(x+3)^2 + 8$$

11) $y = x^2 + 12x + 37$

$$(x^2 + 12x + 36) - 36 + 37$$

$$y = (x+6)^2 + 1$$

13)



(4, 2)

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

2) $f(x) = -2x^2 - 40x - 192$

$$-2(x^2 + 20x + 96)$$

$$(x^2 + 20x + 100) - 100 + 96$$

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

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

$$x^2 + 2x + 1 - 1$$

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

6) $f(x) = 2x^2 - 32x + 129$

$$2(x^2 - 16x + 64.5)$$

$$(x^2 - 16x + 64) - 64 + 64.5$$

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

8) $f(x) = -3x^2 + 60x - 306$

$$-3(x^2 - 20x + 102)$$

$$(x^2 - 20x + 100) - 100 + 102$$

$$f(x) = -3(x-10)^2 - 6$$

10) $f(x) = 4x^2 - 48x + 141$

$$4(x^2 - 12x + 35.25)$$

$$(x^2 - 12x + 36) - 36 + 35.25$$

$$f(x) = 4(x-6)^2 - 3$$

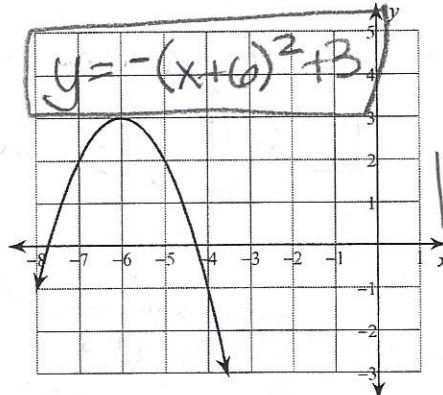
12) $y = 2x^2 - 12x + 11$

$$2(x^2 - 6x + 5.5)$$

$$(x^2 - 6x + 9) - 9 + 5.5$$

$$y = 2(x-3)^2 - 7$$

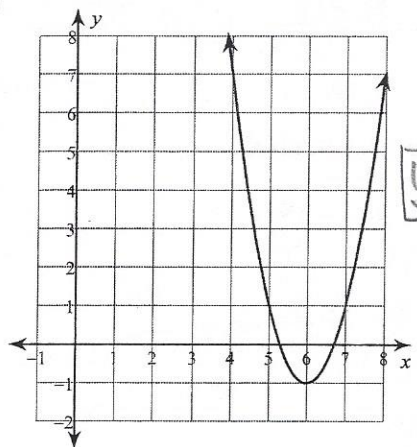
14)



(-6, 3)

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

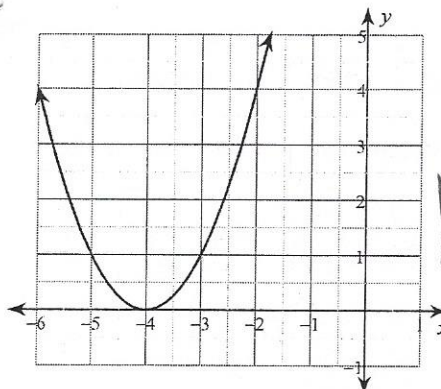
15)



$$(6, -1)$$

$$y = 2(x-6)^2 - 1$$

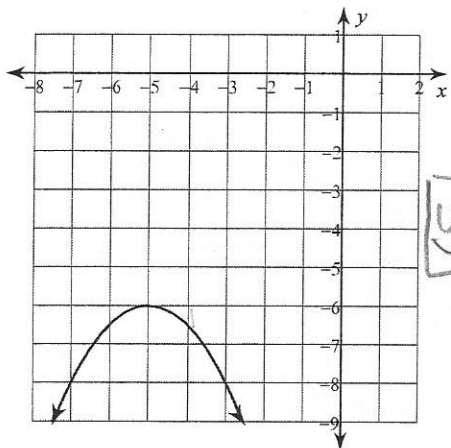
16)



$$(-4, 0)$$

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

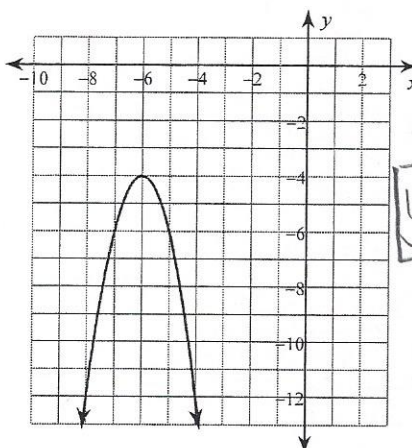
17)



$$(-5, -6)$$

$$y = -\frac{1}{2}(x+5)^2 - 6$$

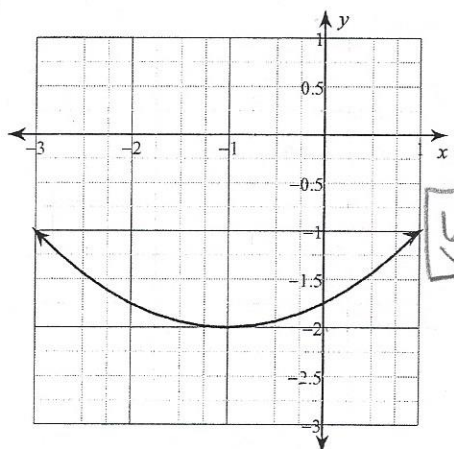
18)



$$(-6, -4)$$

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

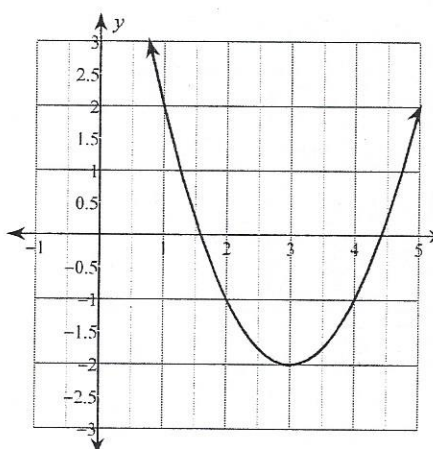
19)



$$(-1, -2)$$

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

20)



$$(3, -2)$$

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

Describe the transformations necessary to transform the graph of $f(x)$ into that of $g(x)$.

$$21) f(x) = x^2$$

$$g(x) = -(x-1)^2$$

Reflection across the
x-axis.
Shifts right 1 unit.

$$22) f(x) = x^2$$

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

Shifts right 3,
up 1 unit

$$23) f(x) = x^2$$

$$g(x) = 2x^2 + 1$$

Vertical Stretch with
a factor of 2
Shifts up 1 unit

$$24) f(x) = x^2$$

$$g(x) = \frac{1}{3}x^2 + 2$$

Vertical Shrink with a
factor of $\frac{1}{3}$
Shifts up 2 units

$$25) f(x) = x^2$$

$$g(x) = \frac{1}{2}(x-3)^2$$

Vertical Shrink with
a factor of $\frac{1}{2}$
Shifts right 3 units

$$26) f(x) = x^2$$

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

Reflection across x-axis
Shifts up 3 units