

2.1

$$y = x^2$$

$$y = 3x^2$$

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

$$y = 3x^2$$



x	y
-3	27
-2	12
-1	3
0	0
1	3
2	12
3	27

$$y = \frac{1}{4}x^2$$

x	y
-4	4
-2	1
-1	$\frac{1}{4}$
0	0
1	$\frac{1}{4}$
2	1
4	4

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

$a > 0$  opens up      Vertex  $(h, k)$   
 $a < 0$  opens down      Intercepts  
 $a > 1$  narrow      y-intercept  $x=0$   
 $0 < a < 1$  wide      x-intercept  $y=0$

17.  $f(x) = 16 - x^2$

$$f(x) = -x^2 + 16$$

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

$$f(x) = -(x-0)^2 + 16$$

Vertex  $(0, 16)$

y-int.  
x=0

$$f(0) = -0^2 + 16$$

$$f(0) = 16$$

Trace  
x=0

$$y = -0^2 + 16$$

$$y = 16$$

$(0, 16)$

x-int  
y=0

$$0 = -x^2 + 16$$

$$\sqrt{x^2} = \sqrt{16}$$

$$x = \pm 4$$

2nd  
Calc

Zero

$(4, 0)(-4, 0)$

$$25. f(x) = x^2 - x + \frac{5}{4}$$

$$y = x^2 - x + \frac{5}{4} - \frac{5}{4}$$

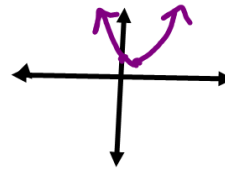
$$y - \frac{5}{4} = x^2 - x + \frac{1}{4}$$

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

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

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

Vertex  $\left(\frac{1}{2}, 1\right)$



y-int  
x=0

$\left(0, \frac{5}{4}\right)$

$$y = x^2 - x + \frac{5}{4}$$

$$y = 0^2 - 0 + \frac{5}{4}$$

$$y = \frac{5}{4}$$

x-int  
y=0

$$0 = \left(x - \frac{1}{2}\right)^2 + 1$$

$$\sqrt{-1} = \sqrt{\left(x - \frac{1}{2}\right)^2}$$

No x-intercepts

$$29. \quad h(x) = 4x^2 - 4x + 21$$

$$y^{-21} = 4x^2 - 4x + 21^{-21}$$

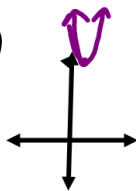
$$y - 21 = 4x^2 - 4x$$

$$y - 21 \stackrel{+1}{=} 4 \left( x^2 - 1x + \frac{1}{4} \right)$$

$$\frac{-1}{2} \left( -\frac{1}{2} \right) \frac{1}{4}$$

$$y - 20 \stackrel{+20}{=} 4 \left( x - \frac{1}{2} \right)^2 \stackrel{+20}{}$$

$$y = 4 \left( x - \frac{1}{2} \right)^2 + 20$$

Vertex  $\left( \frac{1}{2}, 20 \right)$  

y-int  
x=0

(0, 21)

$$h(x) = 4x^2 - 4x + 21$$

$$y = 0 - 0 + 21$$

$$y = 21$$

x-int  
y=0

$$0 = 4 \left( x - \frac{1}{2} \right)^2 + 20$$

$$\frac{-20}{4} = \frac{4 \left( x - \frac{1}{2} \right)^2}{4}$$

$$\sqrt{-5} = \sqrt{\left( x - \frac{1}{2} \right)^2}$$

No x-intercept

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

Vertex  $(h, k)$   $(2, -1)$

Points on parabola  $(x, y)$   $(4, -3)$

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

$$-3 = a(4-2)^2 + -1$$

$$-2 = a(4) - 1$$

$$-2 = \frac{4a}{4}$$

$$-\frac{1}{2} = a$$

Vertex  
 $(2, -1)$   
 $(h, k)$

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

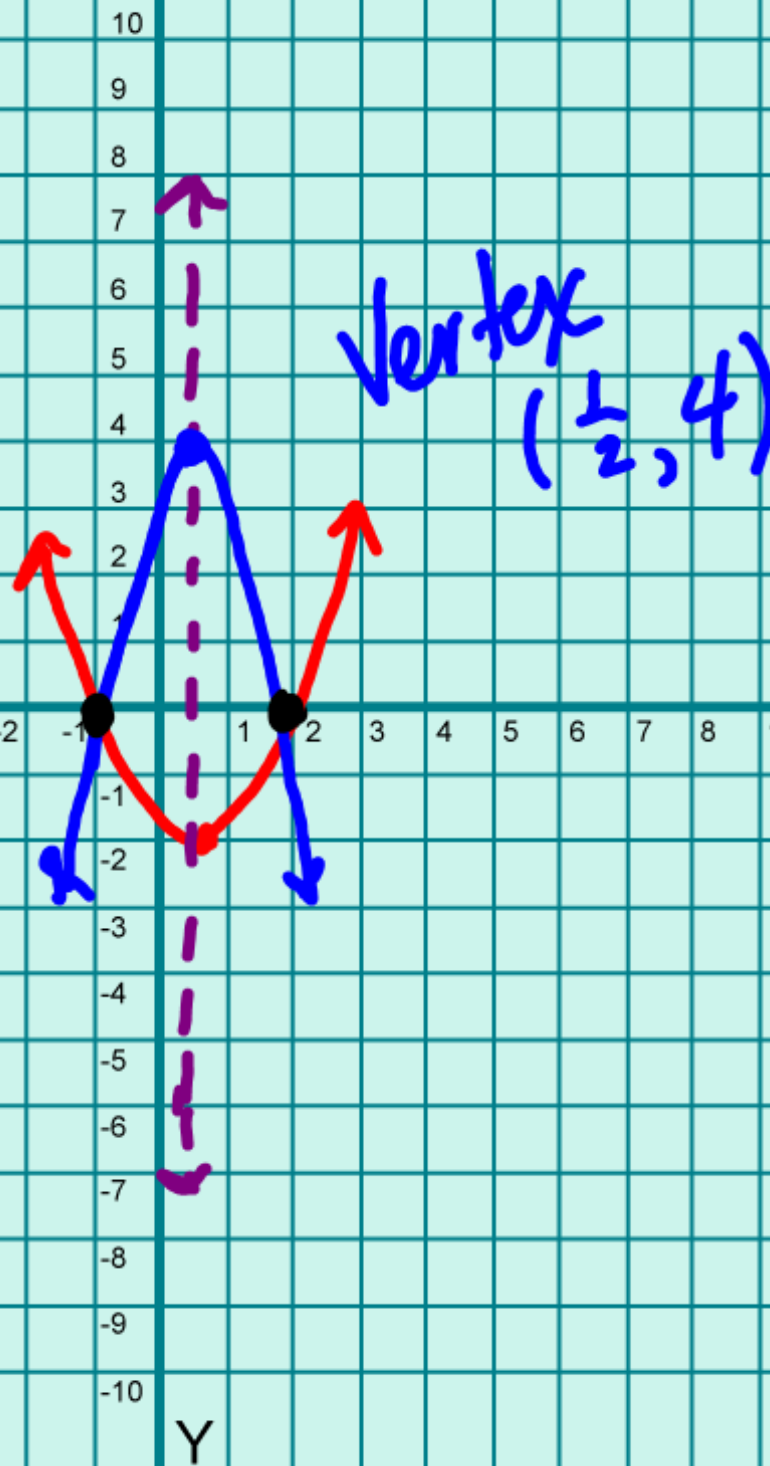
$$f(x) = -\frac{1}{2}(x-2)^2 + -1$$

27.

 $(-1, 0)$   
 $(2, 0)$ 

X

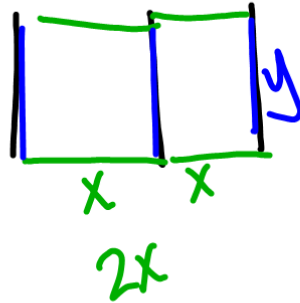
-14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -1 1 2 3 4 5 6 7 8 9 10 11 12 13 14

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

$$45. \quad 200 - 3y = 4x + 3y$$

$$\frac{200 - 3y}{4} = \frac{4x}{4}$$

$$50 - \frac{3}{4}y = x$$



$$A = 2xy$$

$$A = 2\left(50 - \frac{3}{4}y\right)y$$

$$A = \left(100 - \frac{3}{2}y\right)y$$

$$A = 100y - \frac{3}{2}y^2$$

$$A = -\frac{3}{2}y^2 + 100y$$

Calculator  
Max



or complete  
the square