Finding Parabola Equations

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

Vertex: h, k

V: (1, −2) (3, 6) ← given Find the EQ of this parabola

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

$$6+2=a(3-1)^2$$

$$8=a(2)^2$$

$$\frac{8}{4}=\frac{a\cdot 4}{4}$$

$$a=2$$

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

V: (2, -3) y-int: 9 (0, 9)

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

$$9+3=a(0-2)^2$$

$$12=a(-2)^2$$

$$\frac{12}{4}=\frac{a\cdot 4}{4}$$

$$a=3$$

$$\boxed{y+3=3(x-2)^2}$$

V: $(-2,-1)$ x-int: 6 $(6,0)$

$0+1=a(6+2)^2$

$1=a(8)^2$

$1=a\cdot 64$

$\frac{1}{64}=\frac{a\cdot 64}{64}$

$a=1/64$

$$y+1=\frac{1}{64}(x+2)^2$$

$V:(\overset{h}{-3},\overset{k}{3})$ contains origin $(0,0)$

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

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

$-3=a(3)^2$

$\frac{-3=9a}{9}$

$a=-1/3$

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

V: (0, 0) contains (−2, 5)

$y - 0 = a(x - 0)^2$

$y = ax^2$

$5 = a(-2)^2$

$5 = a(4)$

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

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

your turn

V: (-3, 5) x-int: 2

V: (0, 0) contains (-3, -6)