

# 9.3 (part 1) The Parabola



$$y = ax^2 + bx + c$$

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

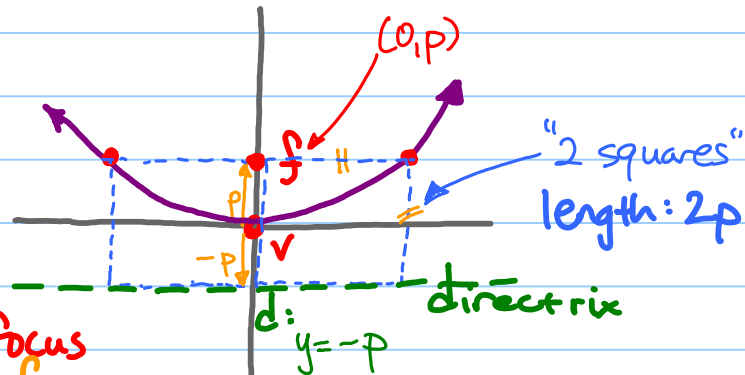
$$(x-h)^2 = 4p(y-k) \quad \text{vertex: } (h, k)$$

$$(y-k)^2 = 4p(x-h)$$

... assume vertex is @ origin!

$$x^2 = 4py$$

$$y^2 = 4px$$



- \* distance  $V \rightarrow f$ :  $p$  units
- \* distance  $V \rightarrow d$ :  $p$  units

ex 1) Graph & Find the focus & directrix

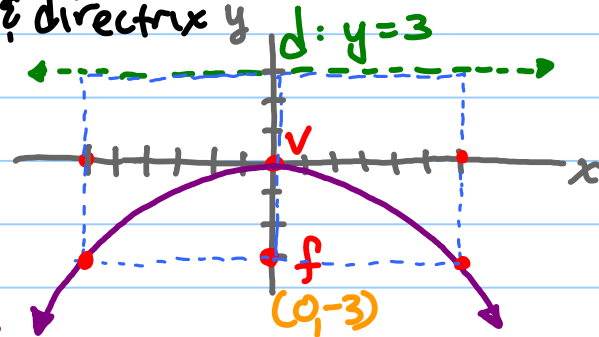
a)  $x^2 = -12y$   
 $x^2 = 4py$

\* find  $p$

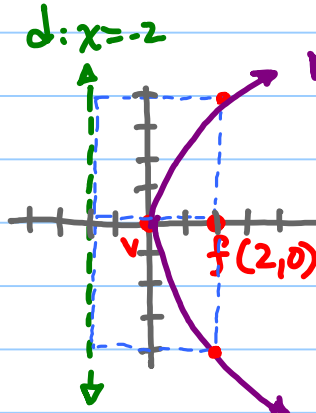
$$-12y = 4py$$

$$-3 = p$$

$C: (0,0)$

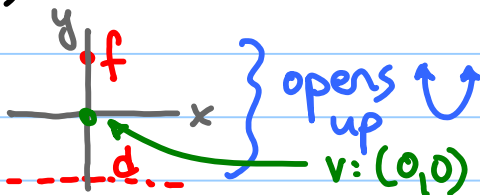


b)  $y^2 = 8x$   
 $y^2 = 4px$   $p=2$



ex 2) Find the standard equation (of the parabola)

a) focus  $(0,15)$  & directrix:  $y = -15$



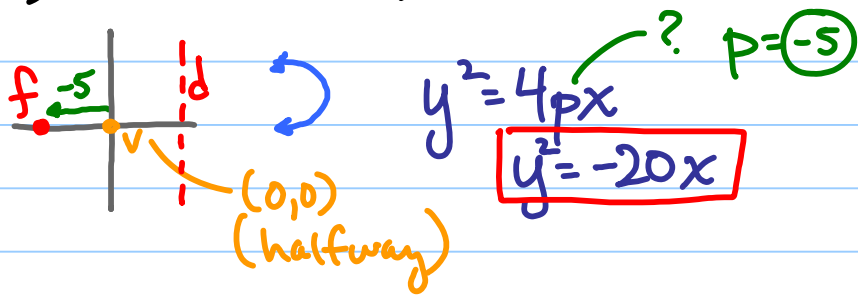
? dist  $v \rightarrow f$ :  $+15$

$$x^2 = 4py$$

$$\therefore x^2 = 4(15)y$$

$$x^2 = 60y$$

b) focus  $(-5,0)$ , directrix:  $x=5$



HW: p 909  
# 1-24