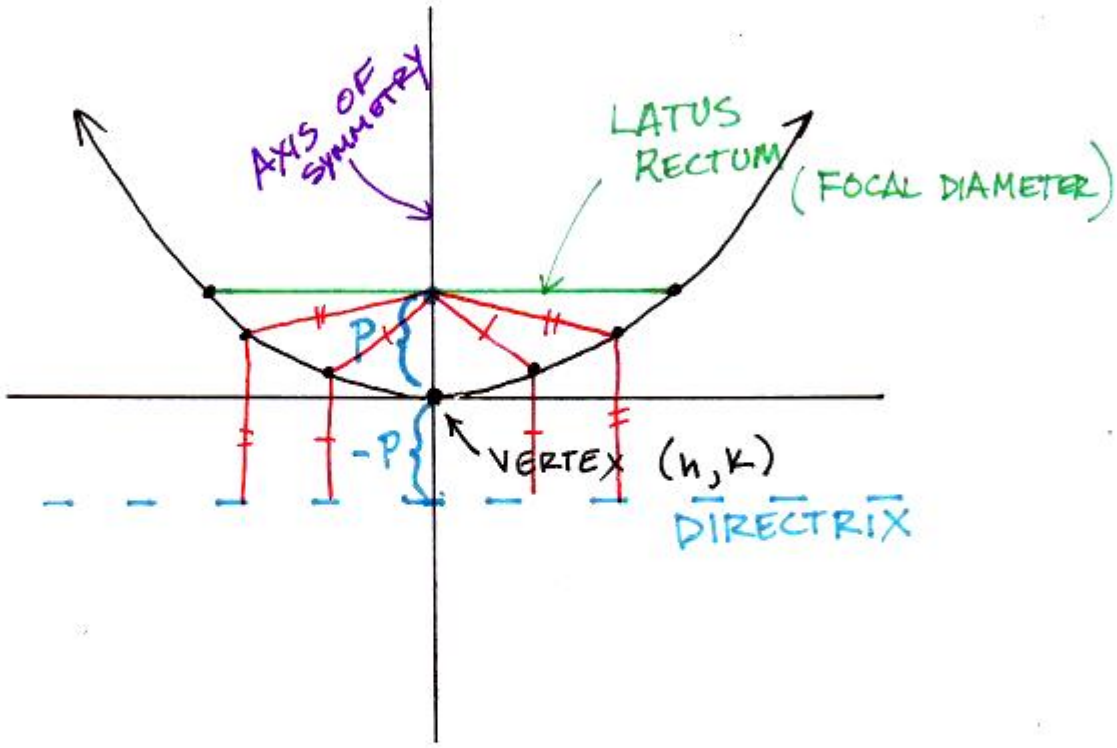
SEC 8.1 PARABOLA

1. PARABOLA: A SET OF POINTS IN A PLANE EQUIDISTANT FROM A FIXED POINT CALLED THE FOCUS, AND A FIXED LINE CALLED THE DIRECTRIX.



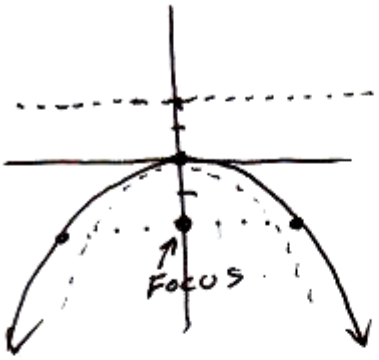
2. EQUATION OF A PARABOLA WHOSE VERTEX IS (0,0) (ORIGIN)

VERTICAL	HORIZONTAL
$x^2 = 4py$	$y^2 = 4px$
VERTEX (0,0)	VERTEX (0,0)
FOCUS (0,P)	FOCUS (P,0)
DIRECTRIX $y = -p$	DIRECTRIX $x = -p$
LENGTH OF LATUS RECTUM $\rightarrow$ $\lvert 4p \rvert$	
AXIS OF SYM $x = 0$	AXIS OF SYMMETRY $y = 0$

ECC = 1 ECC = 1

#1 (WORKSHEET)

$$x^2 = 4(-2)y \qquad p$$



DIRECTION VERTICAL

OPENS DOWN

VERTEX $(0,0)$

FOCUS $(0,-2)$

AXIS OF SYM $x = 0$

ECC 1

LENGTH OF LATUS RECTUM $|4(-2)| = |-8| = 8$

DIRECTRIX $y = 2$

3. EQUATION OF A PARABOLA WHOSE VERTEX IS (h,k) (NOT AT THE ORIGIN)

VERTICAL	HORIZONTAL
$(x-h)^2 = 4p(y-k)$	$(y-k)^2 = 4p(x-h)$
VERTEX (h,k)	VERTEX (h,k)
FOCUS $(h, k+p)$	FOCUS $(h+p, k)$
LATUS RECTUM $\|4p\|$	LATUS RECTUM $\|4p\|$
DIRECTRIX $y = k-p$	DIRECTRIX $x = h-p$
AXIS OF SYM $x=h$	AXIS OF SYM $y=k$
ECC: 1	ECC: 1

4. CONVERT FROM GENERAL FORM TO STANDARD FORM.

12 (WORKSHEET)

$$y^2 + 4x - 6y + 17 = 0$$

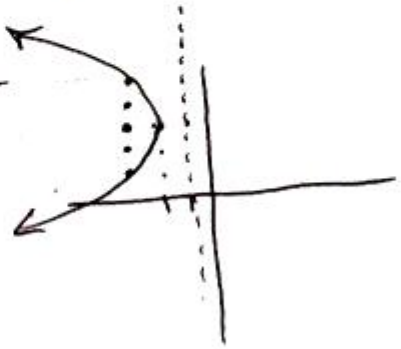
$$y^2 - 6y + \underline{9} = -4x - 17 + \underline{9}$$

$$\left(\tfrac{-6}{2}\right)^2$$

$$(y-3)^2 = -4x - 8$$

$$(y-3)^2 = -4(x+2)$$

$$\boxed{(y-3)^2 = 4(-1)(x+2)}$$



DIRECTION: HORIZONTAL

OPENS: LEFTS

VERTEX: $(-2, 3)$

FOCUS: $(-3, 3)$

DIRECTRIX: $x = -1$

L.R. 4

AXIS OF SYM $y = 3$

ECC: 1