

# 7-1 Conic Sections & Parabolas

Locus  $\rightarrow$  set of points that fulfill a geometric property

parabola  $\rightarrow$  Locus of points in a plane that are equidistant from a fixed point (focus) and a specific line (directrix).

Axis of Symmetry - a line perpendicular to the directrix and goes through the vertex.

General Form:  $Ax^2 + Bxy + Cy^2 + Dx + Ey + F = 0$   
all Conics

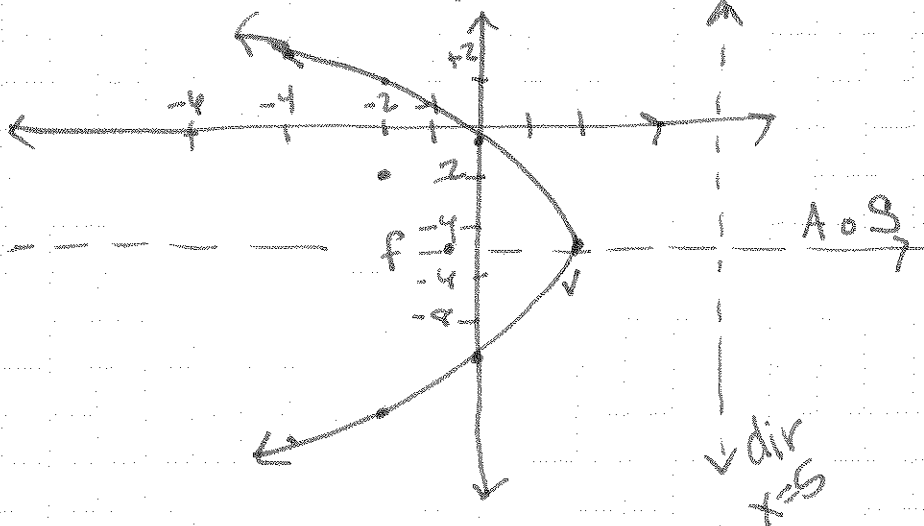
EX1 Vertex, focus, directrix, A of S & graph

$$(y+5)^2 = -12(x-2) \leftarrow \underline{h=2 \quad k=-5 \quad p=-3}$$

$$4p = -12 \quad p = -3$$

vertex =  $(h, k)$   $(2, -5)$  focus  $(h+p, k)$   $(-1, -5)$

directrix  $x = h - p$   $x = 5$  A of Sym  $y = -5$



X	$y_1$	$y_2$
0	-1	-9.9
-2	1.9	-11.9
-4	3.5	-13.5

### Ex: 3. General to Vertex (Standard)

$$y = -\frac{1}{4}x^2 + 3x + 6$$

$$= -\frac{1}{4}(x^2 - 12x) + 6$$

$$= -\frac{1}{4}(\underbrace{x^2 - 12x + 36 - 36}_{\text{factor}}) + 6$$

add/sub  $(\frac{b}{2})^2$  inside()

$$= -\frac{1}{4}((x-6)^2 - 36) + 6$$

re distribute

$$= -\frac{1}{4}(x-6)^2 + 9 + 6$$

$$\boxed{-\frac{1}{4}(x-6) + 15}$$