

2. $y^2 + 12x + 8y - 8 = 0$

combine the equal terms

$$y^2 + 8y = -12x + 8$$

Add 16 both sides

$$y^2 + 8y + 16 = -12x + 8 + 16$$

$$(y+4)^2 = -12x + 24$$

$$= -4(3x-6)$$

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

compare this equation with $(y-k)^2 = 4p(x-h)$

$$4p = -12, p = -3$$

$$h = 2, k = -4$$

Vertex is $(2, -4)$

$$\text{Focus is } (h+p, k) = (2-3, -4) = (-1, -4)$$

directrix is $x = h - p$

$$x = 2 - (-3)$$

$$x = 5$$

Hence Vertex $= (2, -4)$

$$\text{Focus} = (-1, -4)$$

directrix $x = 5$

