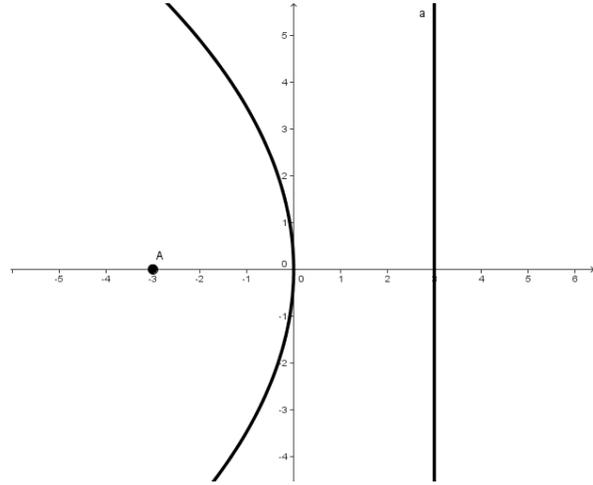
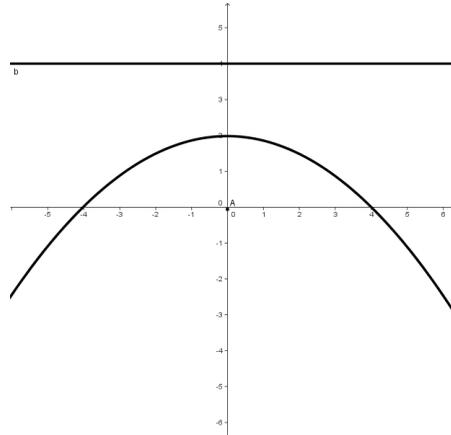


الوحدة السادسة : القطوع المخروطية  
6-1 : القطع المكافئ  
المجموعة A : تمارين أساسية

$$1) -3 = \frac{1}{4a} \rightarrow -12a = 1 \rightarrow a = -\frac{1}{12}$$
$$x = -\frac{1}{12}y^2$$



$$2) y = -\frac{1}{4a} \rightarrow y = 4 \rightarrow 4 = -\frac{1}{4a} \rightarrow -16a = 1$$
$$a = -\frac{1}{16}$$

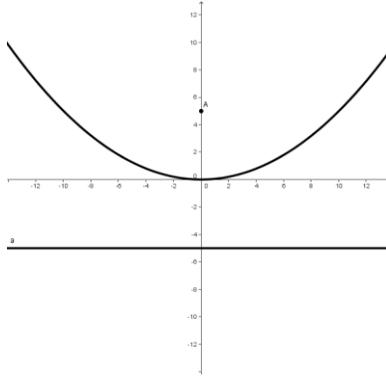


$$y = -\frac{1}{16}x^2$$

3)  $(0, 5)$  ,  $y = 5$

$$y = -\frac{1}{4a} \rightarrow 5 = -\frac{1}{4a} \rightarrow 20a = -1$$

$$\rightarrow a = -\frac{1}{20}$$



$$y = -\frac{1}{20}x^2$$


---

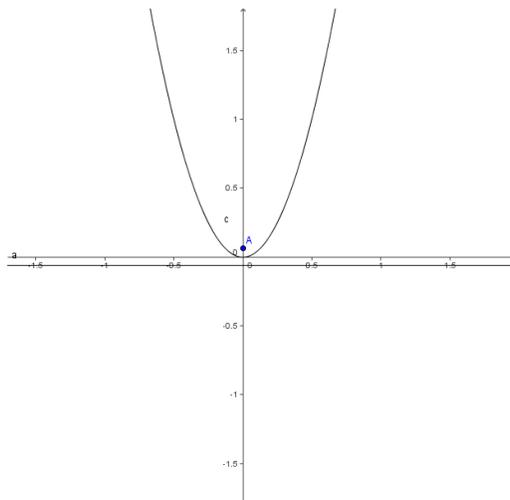
4)  $y = 4x^2$

$$a = 4$$

$$\text{Focus} \left( 0, \frac{1}{4a} \right) = \left( 0, \frac{1}{16} \right)$$

$$\text{directrix } y = -\frac{1}{4a}$$

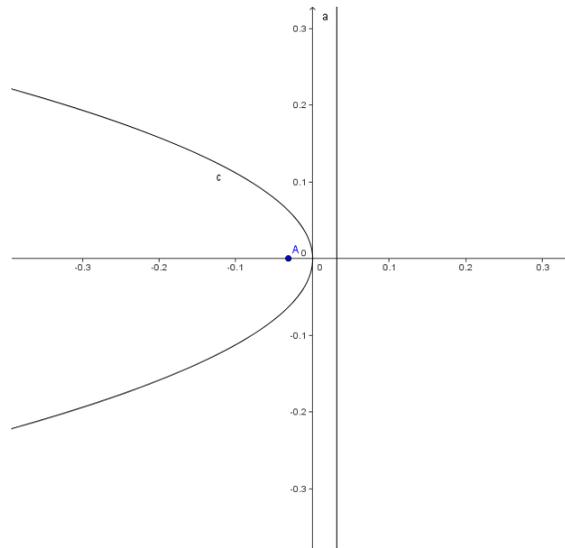
$$= -\frac{1}{4 \times 4} = -\frac{1}{16}$$



$$5) x = -8y^2$$

$$\text{Focus} \left( \frac{1}{4a}, 0 \right) = \left( \frac{1}{4 \times -8}, 0 \right) = \left( \frac{1}{-32}, 0 \right)$$

$$\begin{aligned} \text{directrix } x &= -\frac{1}{4a} \\ &= -\frac{1}{4 \times -8} = \frac{1}{32} \end{aligned}$$



$$6) 10y = x^2$$

$$y = \frac{1}{10}x^2$$

$$a = \frac{1}{10}$$

$$\text{Focus} \left( 0, \frac{1}{4a} \right) = \left( 0, \frac{10}{4} \right) = \left( 0, \frac{5}{2} \right)$$

7) Focus  $(-2, -4)$ , vertex  $(-4, -4)$

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

$$\text{vertex } (h, k) = (-4, -4)$$

$$\text{Focus } \left( h + \frac{1}{4a}, k \right) = \left( -4 + \frac{1}{4a}, -4 \right) = (-2, -4)$$

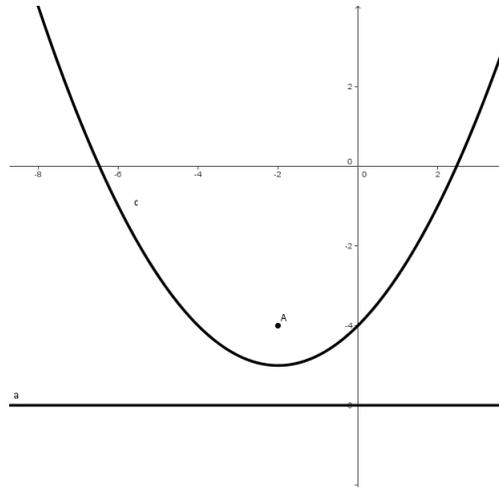
$$\therefore -4 + \frac{1}{4a} = -2$$

$$\rightarrow a = \frac{1}{8}$$

$$\therefore \text{Parabola : } x - h = a (y - k)^2$$

$$x + 4 = \frac{1}{8}(y + 4)^2$$

$$x + 4 = \frac{1}{8}(y + 4)^2$$



8 ) Focus (3,4) , directrix : y = 1

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

$$\text{directrix : } y = k - \frac{1}{4a}$$

$$1 = k - \frac{1}{4a} \dots\dots\dots(1)$$

$$\text{focus : } \left( h, k + \frac{1}{4a} \right) = (3, 4)$$

$$4 = k + \frac{1}{4a} \dots\dots\dots(2)$$

$$1 = k - \frac{1}{4a} \quad (1) + (2)$$

---


$$5 = 2k \dots\dots\dots \rightarrow k = \frac{5}{2}$$

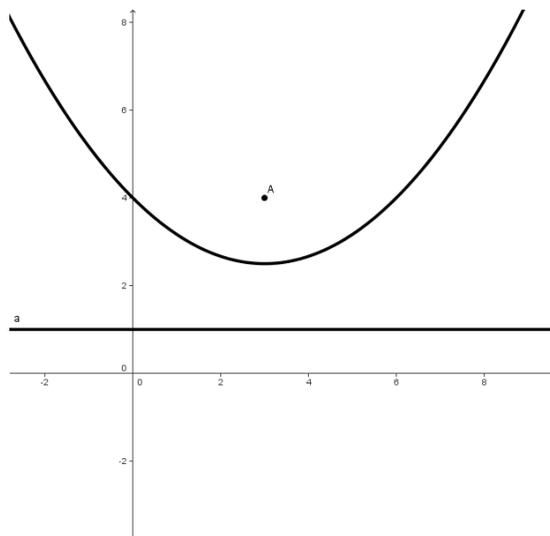
$$\text{from (1) : } 1 = \frac{5}{2} - \frac{1}{4a}$$

$$\frac{1}{4a} = \frac{5}{2} - 1 \rightarrow a = \frac{1}{6}$$

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

$$y - \frac{5}{2} = \frac{1}{6}(x - 3)^2$$

$$y - \frac{5}{2} = \frac{1}{6}(x - 3)^2$$



9) vertex  $(4, 3)$ , directrix  $: x = 6$

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

$$(h, k) = (4, 3)$$

$$\text{directrix} : x = 6$$

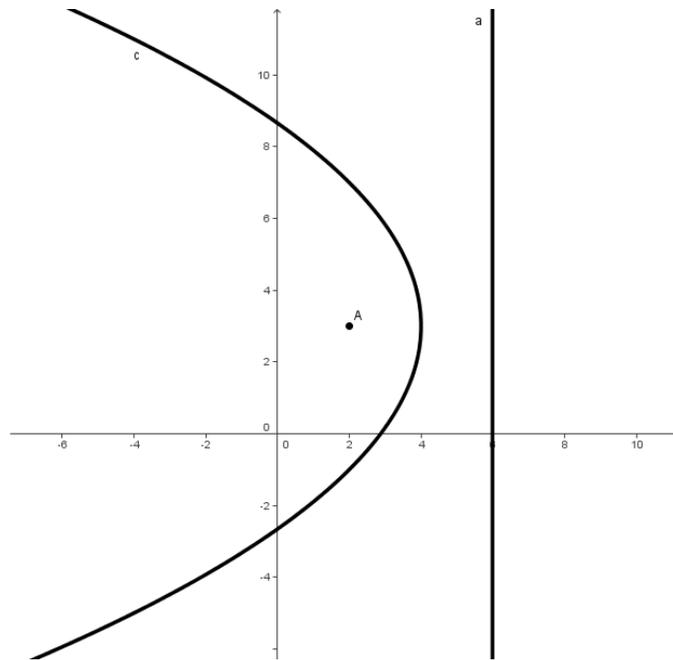
$$x = h - \frac{1}{4a}$$

$$6 = 4 - \frac{1}{4a}$$

$$a = -\frac{1}{8}$$

$$\therefore x - 4 = -\frac{1}{8}(y - 3)^2$$

$$x - 4 = -\frac{1}{8}(y - 3)^2 \rightarrow$$



$$10) \quad 12(y + 1) = (x - 3)^2$$

$$y + 1 = \frac{1}{12}(x - 3)^2$$

$$a = \frac{1}{12}$$

$$h = 3$$

$$k = -1$$

$$\text{vertex : } (h, k) = (3, -1)$$

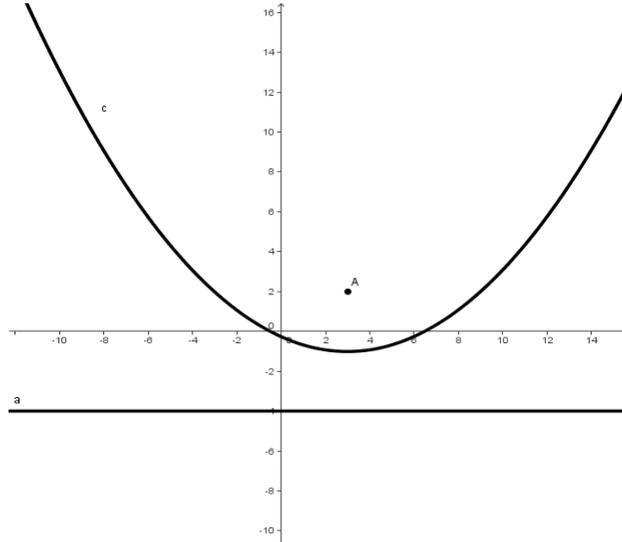
$$\text{Focus : } \left( h, k + \frac{1}{4a} \right) = \left( 3, -1 + \frac{12}{4} \right) = (3, 2)$$

$$\begin{aligned} \text{directrix : } y &= k - \frac{1}{4a} \\ &= -1 - \frac{12}{4} = -1 - 3 = -4 \end{aligned}$$

$$y = -4$$

$$\text{mirror line : } x = 3$$

$$y + 1 = \frac{1}{12}(x - 3)^2$$



$$11) 2 - y = 16(x - 3)^2$$

$$y - 2 = -16(x - 3)^2$$

$$a = -16$$

$$h = 3$$

$$k = 2$$

$$\text{vertex : } (h, k) = (3, 2)$$

$$\text{Focus : } \left( h, k + \frac{1}{4a} \right) = \left( 3, 2 + \frac{1}{4 \times -16} \right) = \left( 3, \frac{127}{64} \right)$$

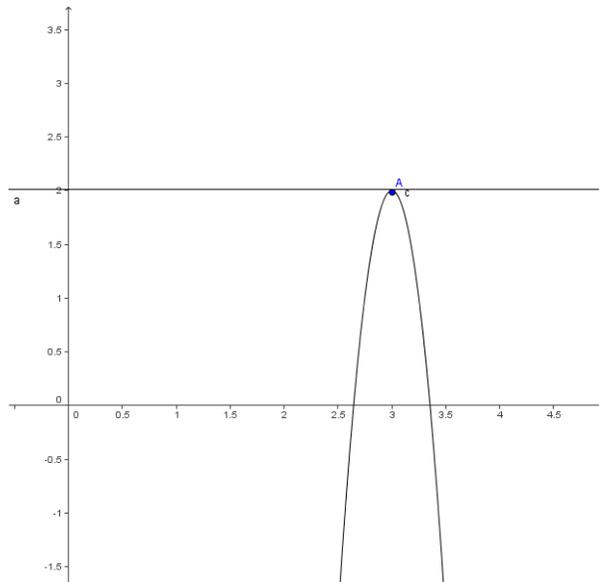
$$\text{directrix : } y = k - \frac{1}{4a}$$

$$= 2 - \frac{1}{4 \times -16} = 2 + \frac{1}{64} = \frac{129}{64}$$

$$y = \frac{129}{64}$$

$$\text{mirror line : } x = 3$$

$$y - 2 = -16(x - 3)^2$$



$$12) x^2 + 2x - y + 3 = 0$$

$$x^2 + 2x = y - 3$$

$$x^2 + 2x + 1 = y - 3 + 1$$

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

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

$$a = 1$$

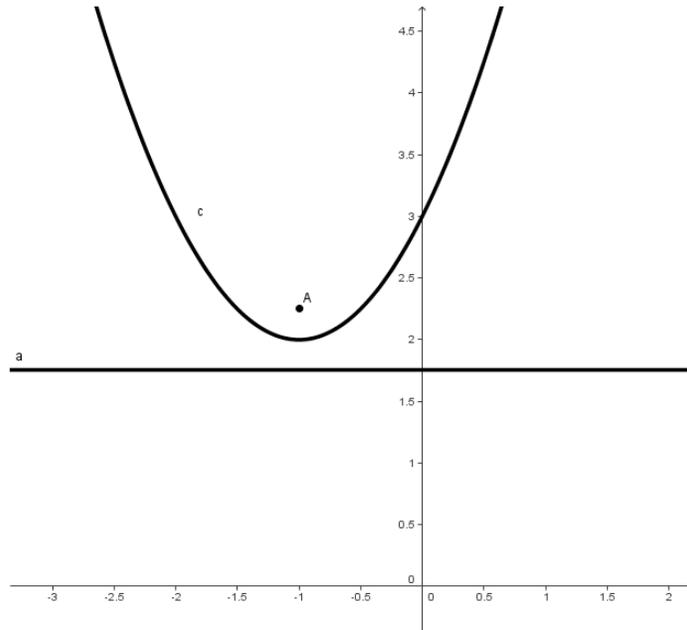
$$h = -1$$

$$k = 2$$

$$\text{vertex : } (h, k) = (-1, 2)$$

$$\text{Focus : } \left( h, k + \frac{1}{4a} \right) = \left( -1, 2 + \frac{1}{4} \right) = \left( -1, \frac{9}{4} \right)$$

$$\begin{aligned} \text{directrix : } y &= k - \frac{1}{4a} \\ &= 2 - \frac{1}{4} = \frac{7}{4} \end{aligned}$$



$$y - 2 = (x + 1)^2 \rightarrow$$

$$13) y^2 - 4y - 8x + 20 = 0$$

$$y^2 - 4y = 8x - 20$$

$$y^2 - 4y + 4 = 8x - 20$$

$$(y - 2)^2 = 8x - 16$$

$$8x - 16 = (y - 2)^2$$

$$x - 2 = \frac{1}{8}(y - 2)^2$$

$$a = \frac{1}{8}$$

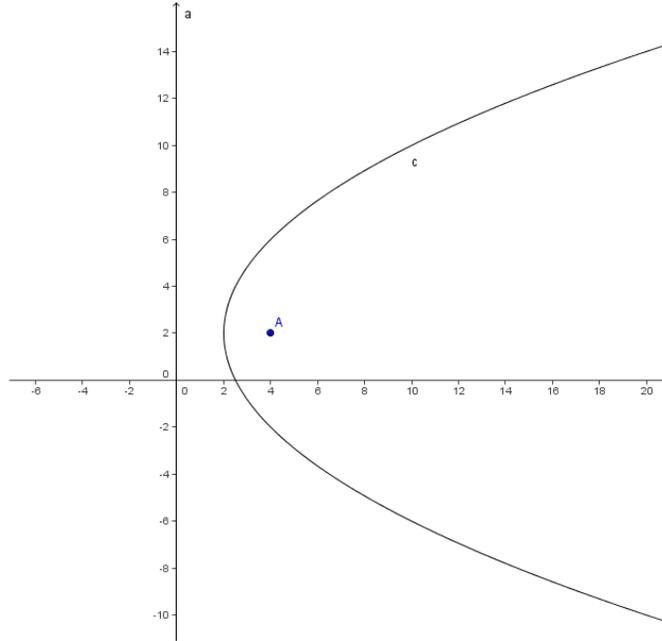
$$h = 2$$

$$k = 2$$

$$\text{vertex} : (h, k) = (2, 2)$$

$$\text{Focus} : \left( h + \frac{1}{4a}, k \right) = \left( 2 + \frac{8}{4}, 2 \right) = (4, 2)$$

$$\text{directrix} : x = h - \frac{1}{4a} = 2 - \frac{8}{4} = 0$$



$$x - 2 = \frac{1}{8}(y - 2)^2 \rightarrow$$