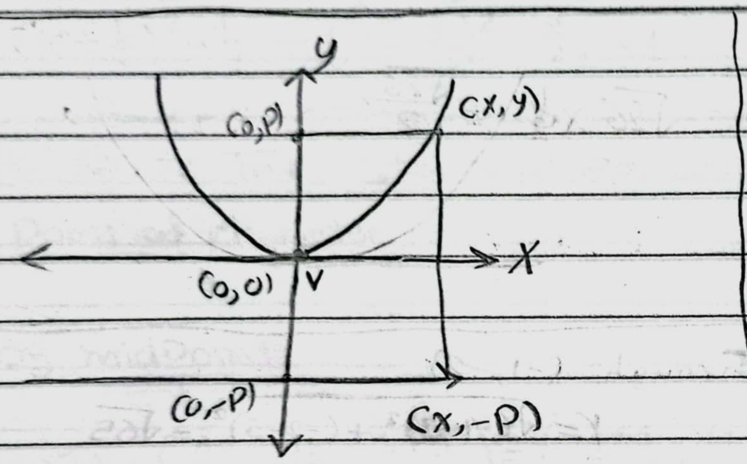
Subject lecture 3 موضوع الدرس

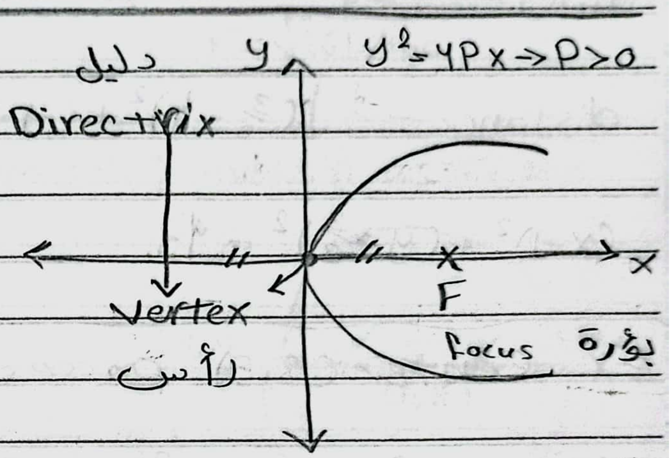
Date التاريخ

Parabola :-

Definition : let F be a Point in The Plane and D be a line not Containing F.

A Parabola is The set of all points equidistance from F and D. The Point F is called focus of The parabola and D is called The directrix of The Parabola
دليل





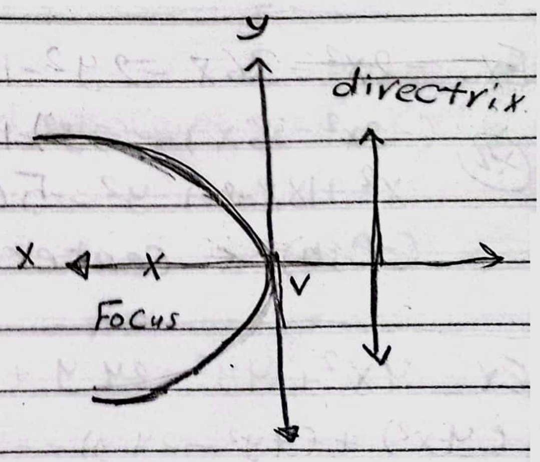
$$\sqrt{(x-0)^2+(y-P)^2} = \sqrt{(x-x)^2+(y-(-P))^2}$$

$$(y-k)^2=4P(x-h), \quad P>0$$

$$x^2+y^2-2Py+P^2 = y^2+2Py+P^2$$

$$x^2=4Py$$

$$y^2=4Px \rightarrow P<0$$



$+P \rightarrow$ Right

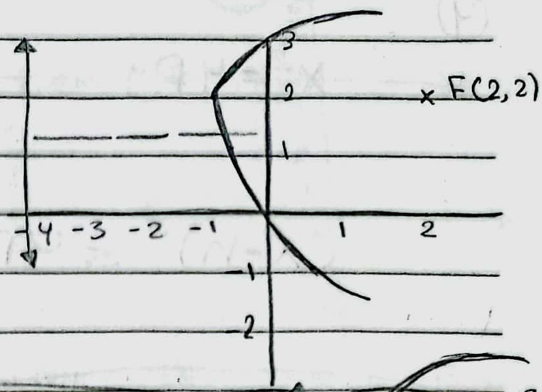
$-P \rightarrow$ left

* Graph $(y-2)^2 = 12(x+1)$ find The vertex, focus and directrix

Sol. الخطوات الى يمشيها

$4P = 12 \rightarrow P = 3$ (vertical)

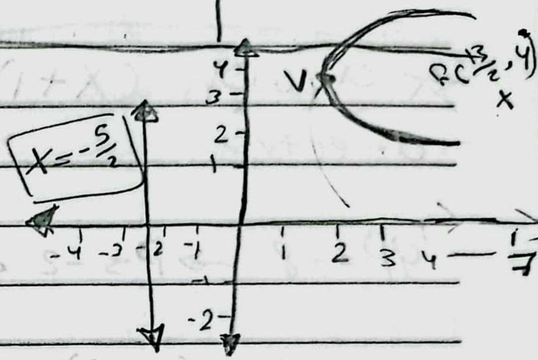
vertex $\rightarrow (-1, 2)$, $\boxed{x = -4}$



* $(y-4)^2 = 18(x-2)$

$4P = 18 \rightarrow P = 4.5 = \frac{9}{2} > 0$ vertical

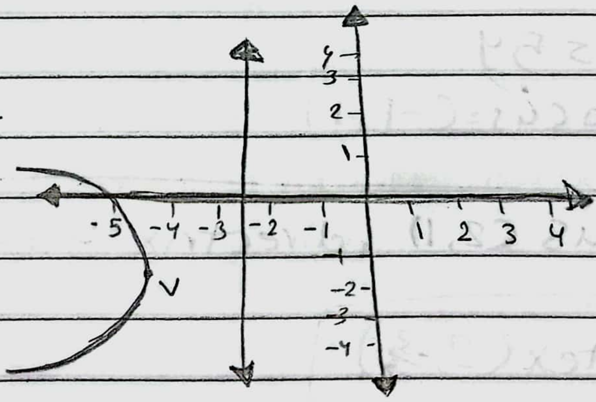
vertex $\rightarrow (2, 4)$



* $(y+\frac{3}{2})^2 = -7(x+\frac{9}{2})$

$4P = -7$ $P = -\frac{7}{4} < 0$ left

vertex $(-\frac{9}{2}, -\frac{3}{2})$



Directrix $= -2.75$

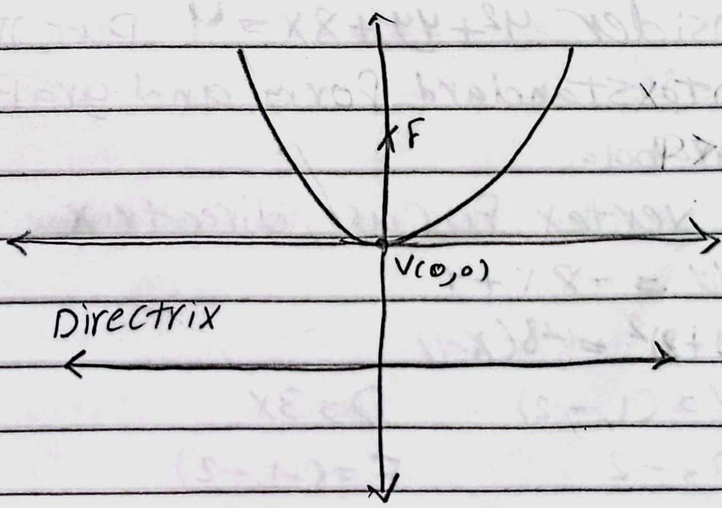
focus $= (6.25, 3)$

$\boxed{x = -\frac{11}{2}}$

③

$x^2 = 4Py$

$P > 0$

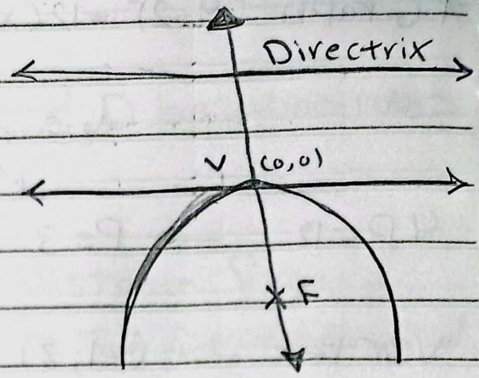


$(x-h)^2 = 4P(y-k)$

$P > 0$

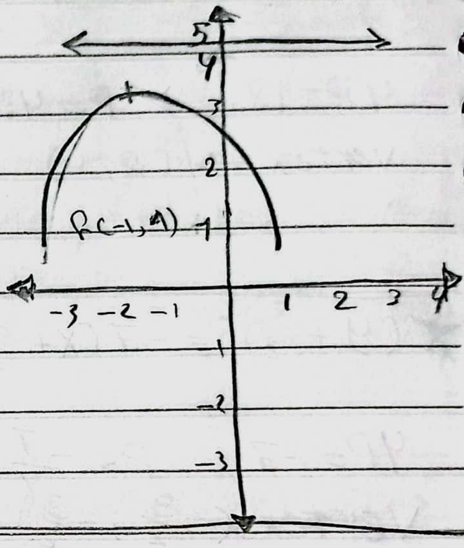
(4)

$x^2=4Py$, $P<0$



$(x-h)^2 = 4P(y-k)$, $P<0$

★ graph $(x+1)^2=-8(y-3)$ find The vertex focus directrix



$4P=-8 \to P=-2<0$

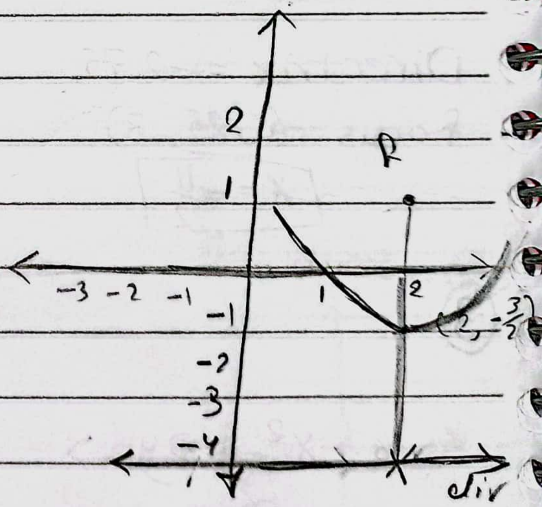
vertex $(-1,3)$

$D = 5y$

focus $=(-1,1)$

★ focus $(2,1)$, directrix $y=-4$

$\boxed{\text{Vertex}(2,-\tfrac{3}{2})}$



★ consider $y^2+4y+8x=4$ put This eq. into standard form and graph The parabola

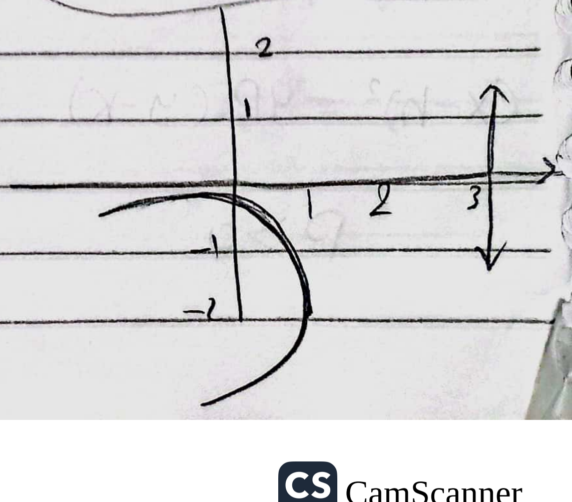
① find vertex, focus, directrix

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

$(y+2)^2=-8(x-1)$

$V=(1,-2)$ $D=3x$

$P=-2$ $F=(-1,-2)$



CS CamScanner

505 - 512

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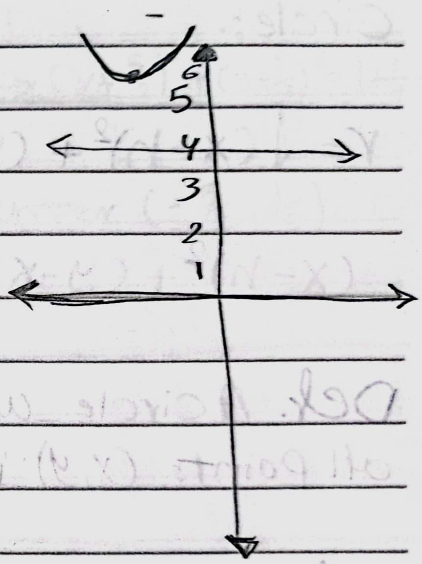
★ $x^2+2x-8y+49=0$

$x^2+2x=8y-49$ $\quad 4P=8$

$(x+1)^2-1=8y-49$ $\quad \boxed{P=2} > 0$ vertical

$(x+1)^2=8(y-6)$ $\quad$ vertex $\rightarrow (-1,6)$



$D=4y$ $\quad f(-1,8)$