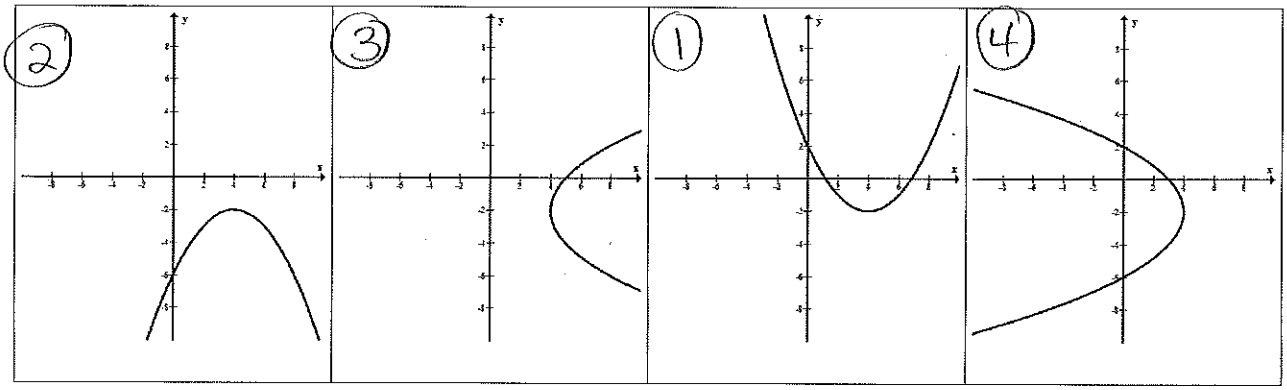
7.2 Practice Problems

Match the equation with the graph.

1. $4(y+2)=(x-4)^2$	2. $-4(y+2)=(x-4)^2$
3. $(y+2)^2=4(x-4)$	4. $(y+2)^2=-4(x-4)$



5a. Find the equation of the parabola described. Focus at $(0,-3)$ and directrix the line $y=3$

① Using the focus & directrix I determined the orientation of the parabola to be ↶↷ thus I will use $x^2=-4ay$

② Find a. a is half the distance between $\frac{6}{2}=3$

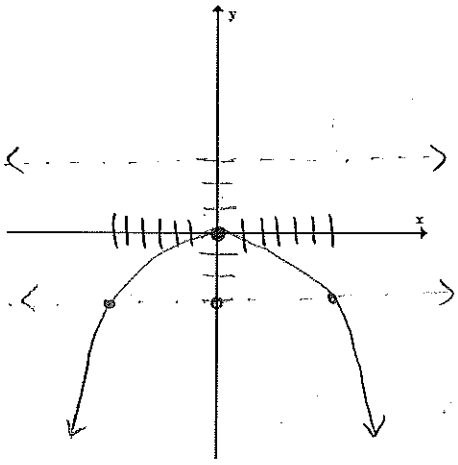
③ Write equation $x^2=-4(3)y$ $x^2=12y$

b. Find the two points that define the latus rectum.

Let $y=-3$

$x^2=-12(-3)$ $x^2=36$ $\sqrt{x^2}=\sqrt{36}$ $x=\pm 6$ $(6,-3)$ $(-6,-3)$

c. Graph the parabola.



the latus rectum are on the same line as the focus

6a. Find the equation of the parabola described. Vertex at $(0,0)$, axis of symmetry is the y-axis and passes through the point $(2,-8)$.

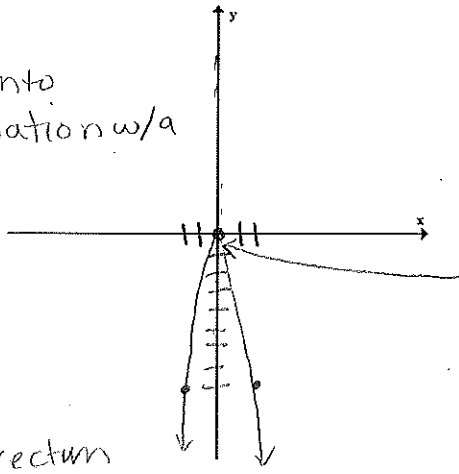
① Using the given info I determined the orientation ↶↷ thus I will use $x^2=-4ay$

② Find a by plugging the values of the ordered pair into the equation $2^2=-4a(-8)$ $\frac{4}{32}=\frac{32a}{32}$ $a=\frac{1}{8}$

③ Write the equation w/a $x^2=-4\left(\frac{1}{8}\right)y$ $x^2=-\frac{1}{2}y$

b. Find the two points that define the latus rectum.

① Find the focus $\left(0,-\frac{1}{8}\right)$



focus $\left(0,-\frac{1}{8}\right)$

c. Graph the parabola.

② Let $y=-\frac{1}{8}$ $x^2=-\frac{1}{2}\left(-\frac{1}{8}\right)$ $x^2=\frac{1}{16}$ $\sqrt{x^2}=\sqrt{\frac{1}{16}}$ $x=\pm\frac{1}{4}$

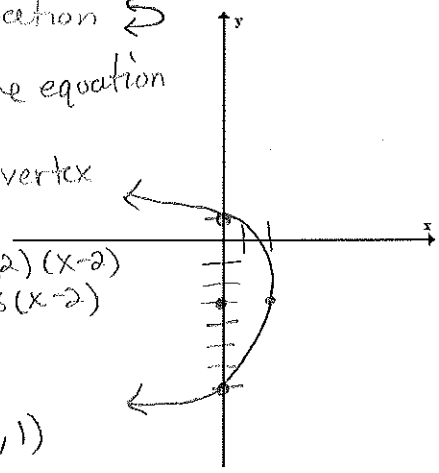
latus rectum $\left(\frac{1}{4},-\frac{1}{8}\right)$ $\left(-\frac{1}{4},-\frac{1}{8}\right)$

7a. Find the equation of the parabola described. Focus at $(0,-3)$ and vertex at $(2,-3)$.

① Use the information given to determine the orientation
thus I will use $y^2 = -4ax$
since the vertex is not the origin I will adjust the equation to $(y+3)^2 = -4a(x-2)$

② Find a. a is the distance between the focus & vertex
$a = 2$

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



b. Find the two points that define the latus rectum.

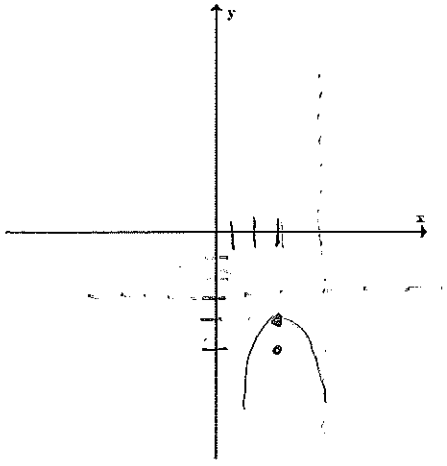
$X=0$ $(y+3)^2 = -8(0-2)$
$(y+3)^2 = -8(-2)$
$(y+3)^2 = 16$
$y+3 = \pm 4$
$-3 \quad -3$
$y = -3 \pm 4$
$= -7, 1$
$(0,-7)$ $(0,1)$

c. Graph the parabola.

8. Given the equation of a parabola find the following. $(x-3)^2 = -4(y+4)$

a. The vertex of the parabola.

$(3,-4)$



b. The focus of the parabola.

$\frac{4}{4} = \frac{4a}{4}$
$1 = a$
$(3,-5)$

c. The directrix of the parabola.

$y = -3$

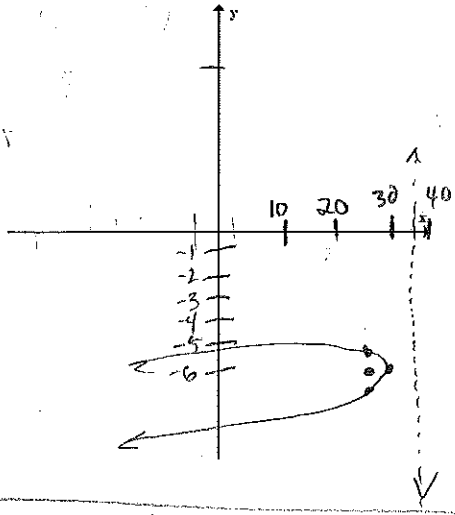
9. Given the equation of a parabola find the following. $y^2+12y=-x+1$

a. Rewrite the expression using completing the square.

$y^2+12y+\_\_\_ = -x+1+\_\_\_$
$y^2+12y+36 = -x+1+36$
$(y+6)^2 = -x+37$
$(y+6)^2 = -1(x-37)$

orientation Left

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



b. The vertex of the parabola.

$(37,-6)$

c. The focus of the parabola.

Since parabola is left facing
focus is to the left of the vertex
$(37-\frac{1}{4}, -6) = (36\frac{3}{4}, -6)$

d. The directrix of the parabola.

The directrix is $\frac{1}{4}$ to the right

$x = 37 + \frac{1}{4}$
$= 37\frac{1}{4}$

Latus Rectum points
$(y+6)^2 = -1(36\frac{3}{4} - 37)$
$(y+6)^2 = -1(-\frac{1}{4})$
$(y+6)^2 = \frac{1}{4}$
$y+6 = \pm\frac{1}{2}$
$y = -6 \pm \frac{1}{2}$

$y = -6\frac{1}{2}$
$y = -5\frac{1}{2}$