Pre-AP Precal

Identifying Conics

Name Key

Date _____

Tell which conic is represented by the equation.

1. $2x^2 + 6y - 9 = 0$

parabola

2. $-2x^2 + 3y^2 + 6x - 3y - 9 = 0$

hyperbola

3. $16x^2 + 16y^2 - 27 = 0$

circle

4. $-4x^2 - 20y^2 + 50 = 0$

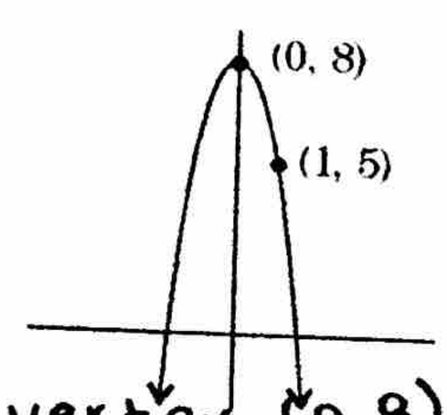
ellipse

5. $y^2 + 2x + 8 = 0$

parabola

Write the equation of the graph.

6.



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

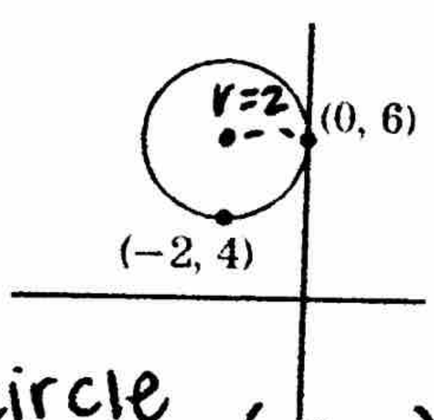
$5 - 8 = 4p(1-0)^2$

$-3 = 4p(1)$

$\boxed{y - 8 = -3x^2}$

vertex (0,8)
vertical, down

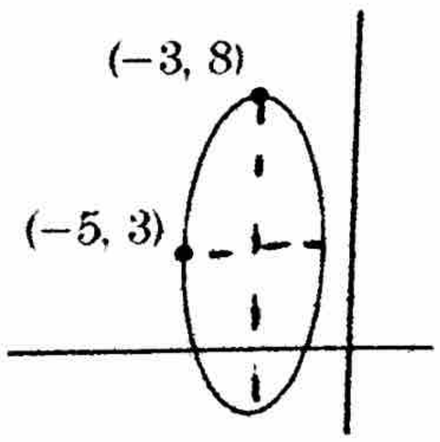
7.



$(x+2)^2 + (y-6)^2 = 4$

circle
center (-2,6)
r = 2

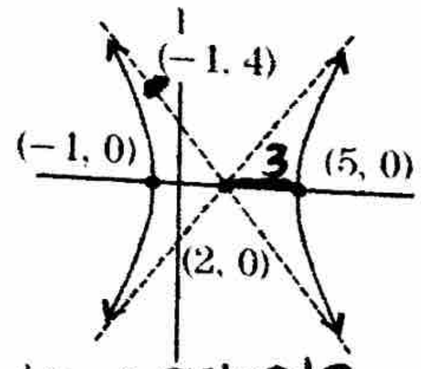
8.



$\frac{(x+3)^2}{4} + \frac{(y-3)^2}{25} = 1$

ellipse
center (-3,3)
a = 2
b = 5

9.



$\frac{(x-2)^2}{9} - \frac{y^2}{16} = 1$

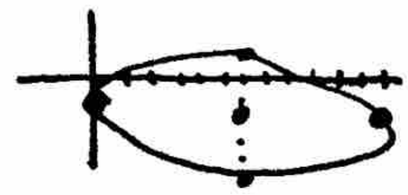
hyperbola
horizontal
center (2,0)

a=3

$\frac{b}{a} = \frac{4}{3}$

10. Find an equation of the ellipse with vertices $(0, -1)$ and $(12, -1)$ and minor axis of length 6.

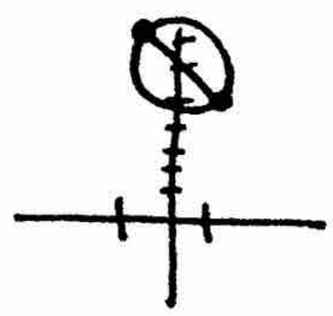
$b = \frac{6}{2} = 3$



$\frac{(x-6)^2}{36} + \frac{(y+1)^2}{9} = 1$

center (6,-1)
a = 6

11. Find the equation of the circle with diameter endpoints $(1, 5)$ and $(-1, 7)$.



radius $= \frac{1}{2}\sqrt{(7-5)^2 + (-1-1)^2}$

$= \frac{1}{2}\sqrt{4+4}$

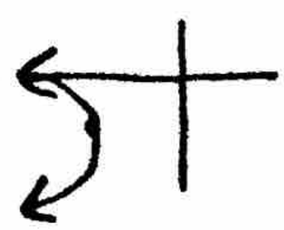
$= \frac{1}{2}\sqrt{8} = \frac{2\sqrt{2}}{2} = \sqrt{2}$

center
(0,6)

$\boxed{x^2 + (y-6)^2 = 2}$

12. Find the equation of the parabola that opens to the left, has a vertex of $(-4, -1)$, and is congruent to the parabola $x = -10y^2$.

$4p = -10$



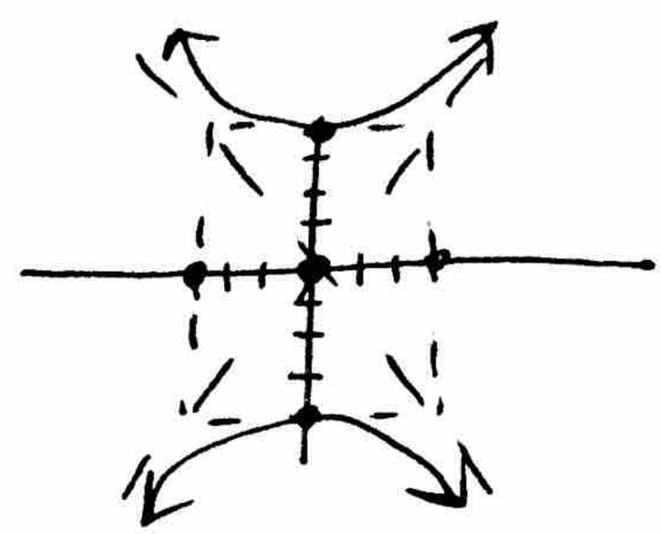
$\boxed{(y+1)^2 = -10(x+4)}$

Graph each equation (label important features).

13. $\frac{y^2}{16} - \frac{x^2}{9} = 1$

· hyperbola
· vertical
· center (0,0)

a = 4 (along y)
b = 3 (along x)

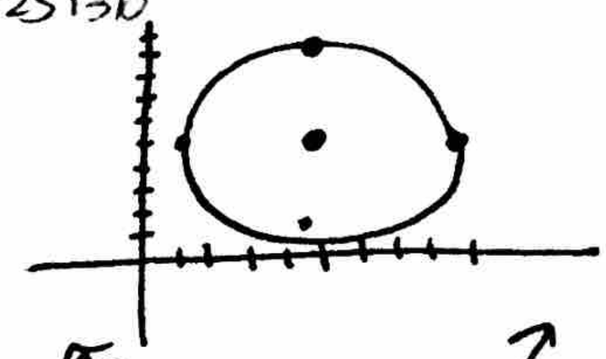


center : (0,0)
vertices
(0,4)
(0,-4)

14. $x^2 + y^2 - 10x - 12y + 45 = 0$

· circle
· complete the square!

$x^2 - 10x + 25 + y^2 - 12y + 36 = -45 + 25 + 36$
$(x-5)^2 + (y-6)^2 = 16$
center (5,6)
r = 4

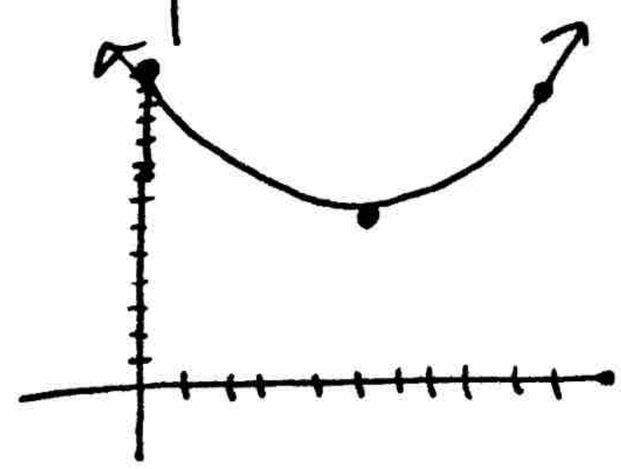


center (5,6)
radius = 4

15. $5y = x^2 - 10x + 60$

· parabola
vertical
opens up

$+25 + 5y - 60 = x^2 - 10x + 25$
$5y - 35 = (x-5)^2$
$5(y-7) = (x-5)^2$
vertex (5,7)



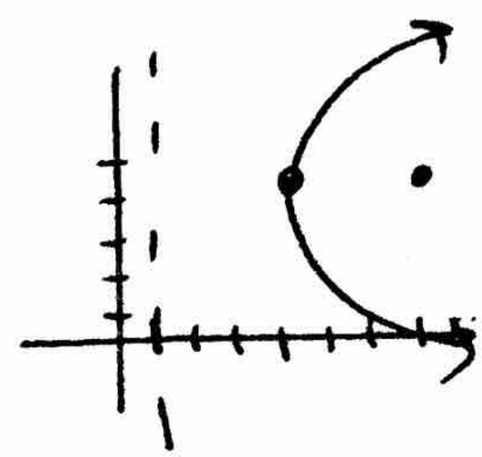
vertex (5,7)

x	y
0	12
10	12

16. $(y-5)^2 = 12(x-4)$

· parabola
· horizontal
· opens right

12 = 4p
3 = p
vertex (4,5)

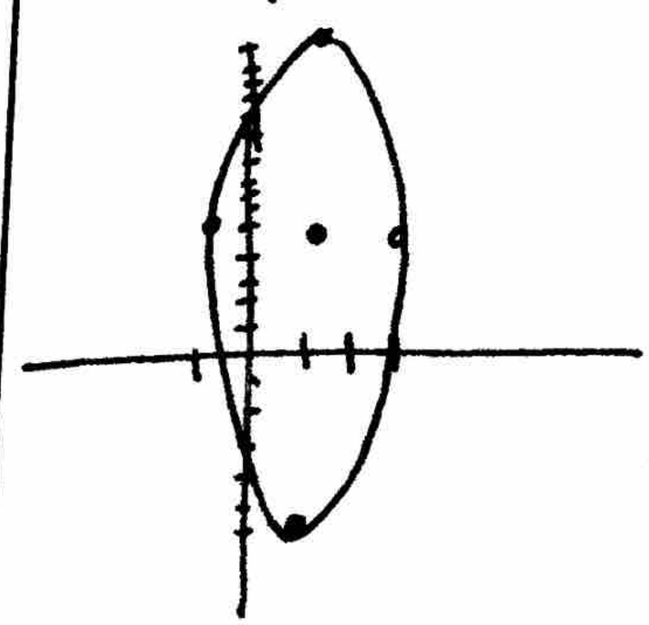


vertex (4,5)
focus (7,5)
directrix x = 1

17. $\frac{(x-1)^2}{4} + \frac{(y-5)^2}{100} = 1$

· ellipse
· center
(1,5)

a = 2 (along x)
b = 10 (along y)



center
(1,5)

vertices
(3,5)
(-1,5)
(1,-5)
(1,15)