ecalculus

Name_____

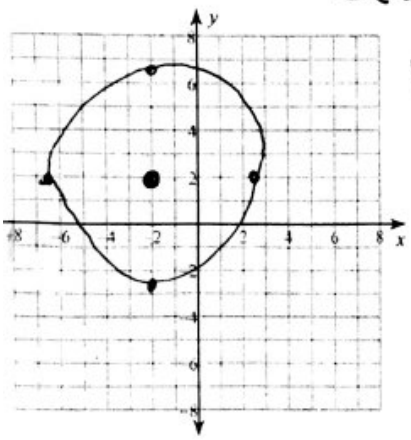
ractice with Conic Sections

Date_____

raph each equation.

Circle

$(x+2)^2 + (y-2)^2 = 21$ C(-2,2)

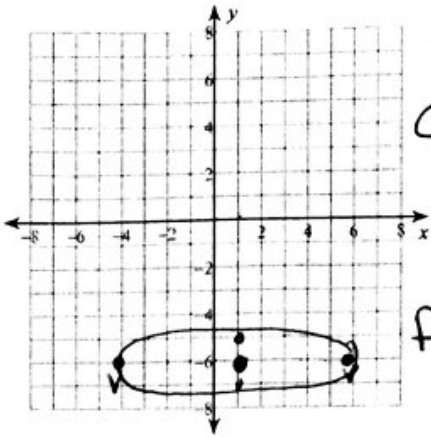


$r=\sqrt{21}$

2) $\frac{(x-1)^2}{25} + (y+6)^2 = 1$

ellipse

C(1,-6)



V(6,-6)(-4,-6)

CV:(1,-5)(1,-7)

$c^2 = 25-1$

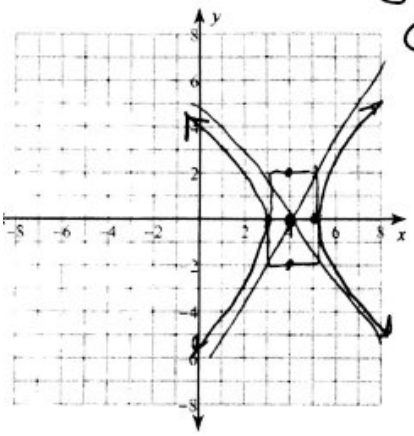
$c=\sqrt{24}=2\sqrt{6}$

F($1+2\sqrt{6}$,-6)

($1-2\sqrt{6}$,-6)

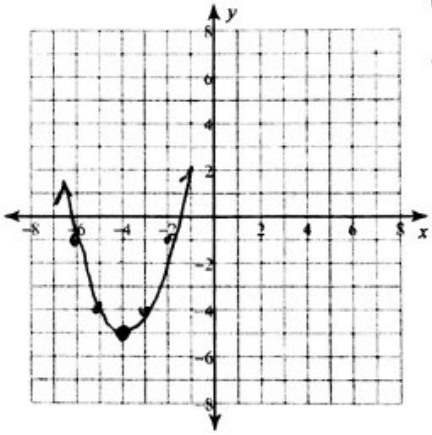
$(x-4)^2 - \frac{y^2}{4} = 1$ hyperbola

C(4,0)



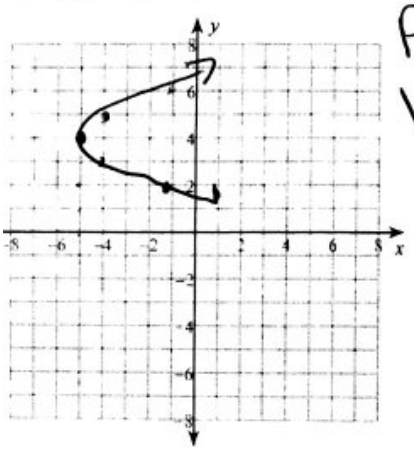
4) $y=(x+4)^2-5$ Parabola

V(-4,-5)

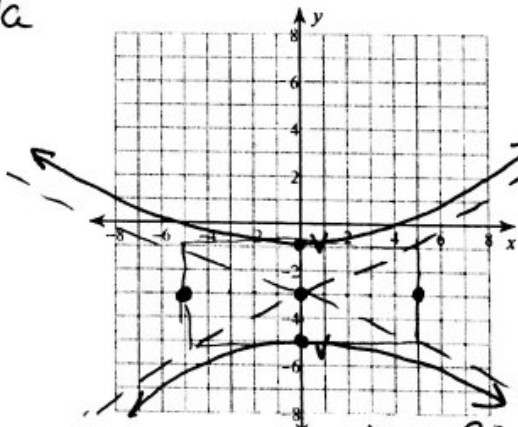


$x=(y-4)^2-5$ Parabola

V(-5,4)



6) $-4x^2+25y^2+150y+125=0$



C(0,-3)

$-4x^2+25(y^2+6y+\underline{9})=-125+\underline{225}$

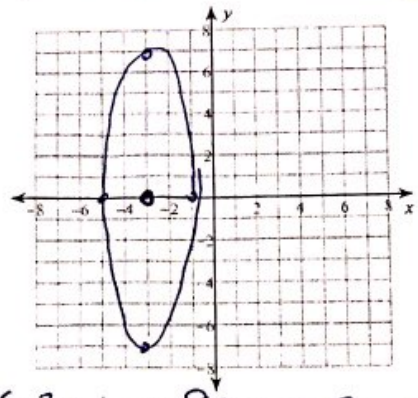
$-4x^2+25(y+3)^2=100$

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

-1-

49.6

7) $49x^2 + 4y^2 + 294x + 245 = 0$ Ellipse



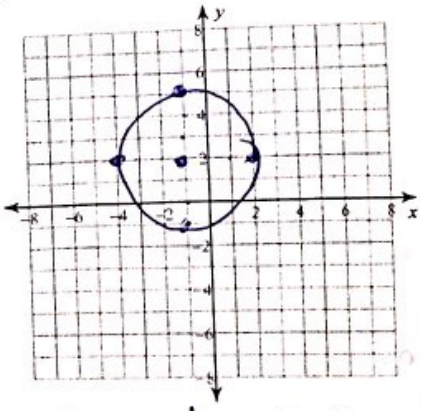
C(-3,0)

$49(x^2+6x+\frac{9}{}) + 4y^2 = -245 + \frac{441}{}$

$49(x+3)^2 + 4y^2 = 196$

$\frac{(x+3)^2}{4} + \frac{y^2}{49} = 1$

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



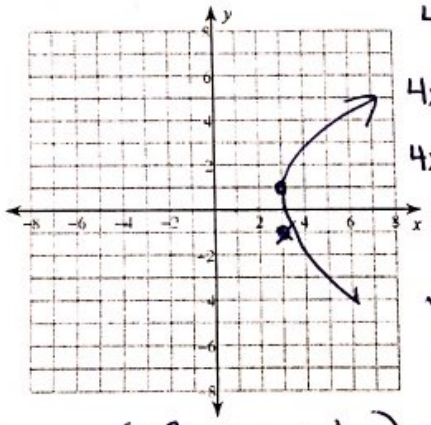
$x^2+2x+\frac{1}{} + y^2 - 4y + \frac{4}{} = \frac{1}{} + \frac{4}{}$

$(x+1)^2 + (y-2)^2 = 9$

C(-1,2)

r = 3

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



$4x - 13 = y^2 - 2y$

$4x - 13 + \frac{1}{} = y^2 - 2y + \frac{1}{}$

$4x - 12 = (y-1)^2$

$x = \frac{1}{4}(y-1)^2 + \frac{12}{4}$

V(3,+1)

V(3,+1)

$4x - 1(y^2 - 2y + \frac{1}{}) = 13 + \frac{-1}{}$

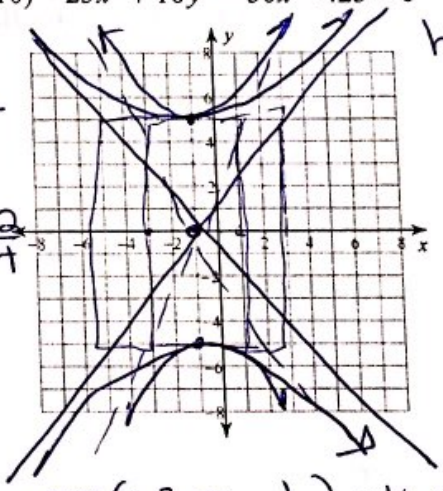
$4x - 1(y-1)^2 = 12$

$4x = (y-1)^2 + 12$

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

V(3,1)

10) $-25x^2 + 16y^2 - 50x - 425 = 0$



hyperbola

$-25(x^2+2x+\frac{1}{}) + 16y^2 = 425 + \frac{-25}{}$

$-25(x+1)^2 + 16y^2 = 400$

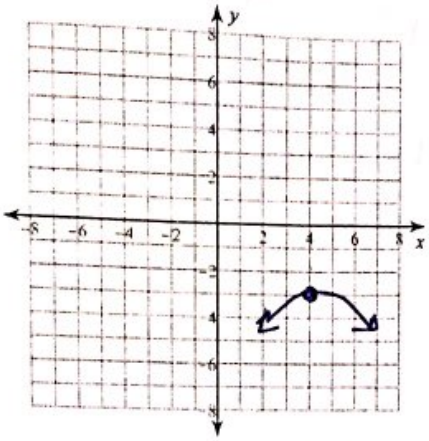
$\frac{y^2}{25} - \frac{(x+1)^2}{16} = 1$

C(-1,0)

a = 5

b = 4

11) $x^2 - 8x + 4y + 28 = 0$ Parabola



V(4, -3)

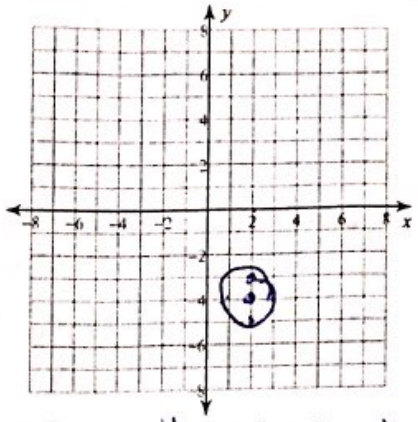
$-4y - 28 + 16 = x^2 - 8x + 16$

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

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

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

12) $x^2 + y^2 - 4x + 8y + 19 = 0$ Circle



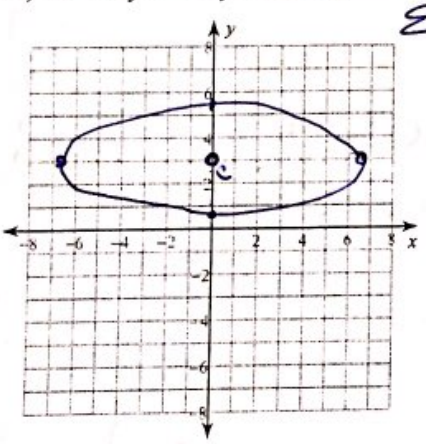
$x^2 - 4x + 4 + y^2 + 8y + 16 = -19 + 4 + 16$

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

C(2, -4)

r = 1

13) $x^2 + 9y^2 - 54y + 36 = 0$ Ellipse



$x^2 + 9(y^2 - 6y + 9) = -36 + 81$

$x^2 + 9(y-3)^2 = 45$

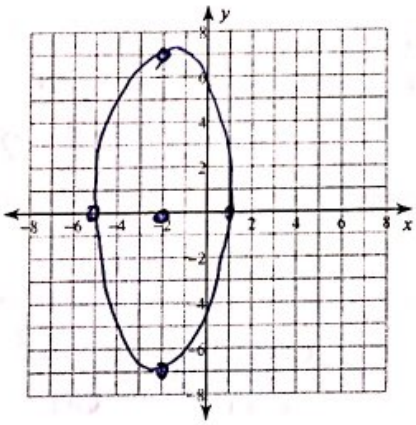
$\frac{x^2}{45} + \frac{(y-3)^2}{5} = 1$

C(0, 3)

$a = \sqrt{45}$

$b = \sqrt{5}$

14) $49x^2 + 9y^2 + 196x - 245 = 0$ Ellipse



$49(x^2 + 4x + 4) + 9y^2 = 245 + 196$

$49(x+2)^2 + 9y^2 = 441$

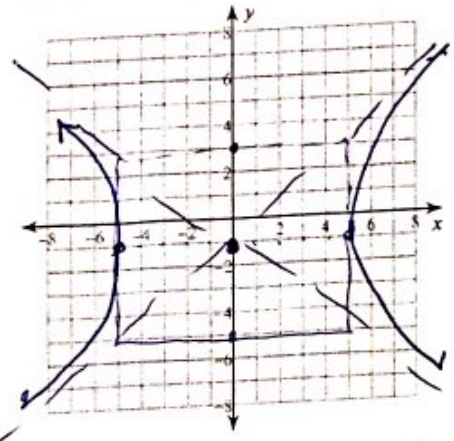
$\frac{(x+2)^2}{9} + \frac{y^2}{49} = 1$

C(-2, 0)

a = 7

b = 3

15) $16x^2 - 25y^2 - 50y - 425 = 0$



Hyperbola

$16x^2 - 25(y^2 + 2y + 1) = 425 + -25$

$16x^2 - 25(y+1)^2 = 400$

$\frac{x^2}{25} - \frac{(y+1)^2}{16} = 1$

$c(0,-1)$

$a = 5$

$b = 4$

Use the information provided to write the standard form equation of each circle.

16) Center: $(0, -13)$
Radius: 2

$x^2 + (y+13)^2 = 4$

17) Center: $(14, 3)$
Point on Circle: $(14, -2)$

$(x-14)^2 + (y-3)^2 = r^2$

$(14-14)^2 + (-2-3)^2 = r^2$

$25 = r^2$

$(x-14)^2 + (y-3)^2 = 25$

Use the information provided to write the vertex form equation of each parabola.

18) Vertex: $(0, -4)$, Focus: $\left(-\frac{1}{8}, -4\right)$

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

$a = \frac{1}{4(-1/8)} = \frac{1}{-1/2} = -2$

19) Vertex: $(-4, 3)$, Directrix: $y = \frac{23}{8}$

$c = 1/8$

$a = \frac{1}{4(1/8)} = 2$

$y = 2(x+4)^2 + 3$

Use the information provided to write the standard form equation of each hyperbola.

20) Vertices: $(-10, 9), (-10, -13)$
Foci: $(-10, -2 + \sqrt{185}), (-10, -2 - \sqrt{185})$

$\frac{(y+2)^2}{121} + \frac{(x+10)^2}{64} = 1$

$c(-10, -2)$

$h \quad k$

$a = 11$

$a^2 = 121$

Use the information provided to write the standard form equation of each ellipse.

21) Vertices: $(-1, 5), (-1, -23)$
Foci: $(-1, -9 + 7\sqrt{3}), (-1, -9 - 7\sqrt{3})$

$a = 14$

$a^2 = 196$

$c^2 = a^2 + b^2$

$(7\sqrt{3})^2 = 121 + b^2$

$64 = b^2$

center $(-1, -9)$

$c^2 = a^2 - b^2$

$(7\sqrt{3})^2 = 196 - b^2$

$49(3) = 196 - b^2$

$147 = 196 - b^2$

$-49 = -b^2$

$49 = b^2$

$\frac{(x+1)^2}{49} + \frac{(y+9)^2}{196} = 1$

22) Foci: $(5, 6 + \sqrt{15}), (5, 6 - \sqrt{15})$

Endpoints of major axis: $(5, 6 + 5\sqrt{5}), (5, 6 - 5\sqrt{5})$

$$\frac{(x-5)^2}{110} + \frac{(y-6)^2}{125} = 1$$

Use the information provided to write the standard form equation of eac

23) Vertices: $(6, 12), (6, -12)$

Asymptotes: $y = 4x - 24$

$y = -4x + 24$

$$\frac{y^2}{144} - \frac{(x-6)^2}{9} = 1$$