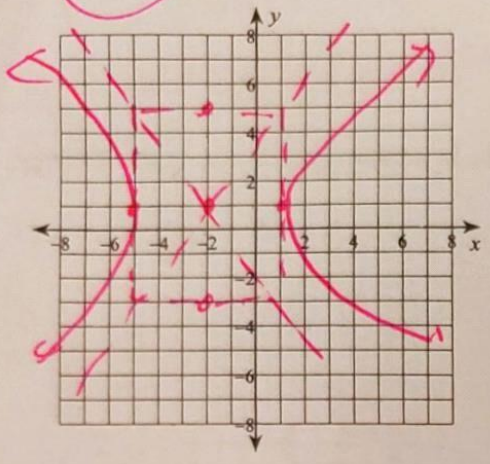
Precalculus

Warm Up-Hyperbolas

Graph each equation.

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



Center: (-2 , 1)

a^2 = 9 a = 3

b^2 = 16 b = 4

Transverse axis: x

Vertices: (1 , 1) & (-5 , 1)

Co-Vertices: (-2 , -3) & (-2 , 5)

Foci Distance: $c^2 = a^2 + b^2$

$c^2 = \sqrt{16+9}$

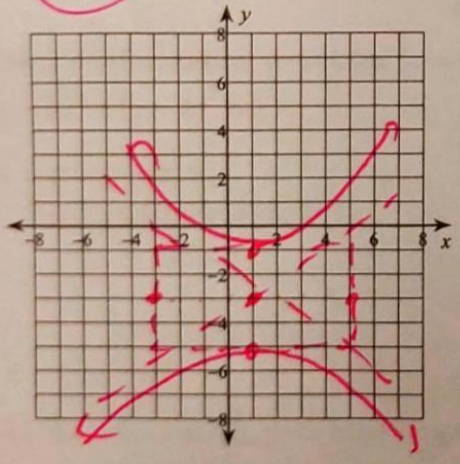
$c = \pm 5$

Foci Points:

$(-2 \pm 5, 1)$

$(-7, 1), (3, 1)$

2) $\frac{(y+3)^2}{4} - \frac{(x-1)^2}{16} = 1$



Center: (1 , -3)

a^2 = 4 a = 2

b^2 = 16 b = 4

Transverse axis: y

Vertices: (1 , -1) & (1 , -5)

Co-Vertices: (-3 , -3) & (5 , -3)

Foci Distance: $c^2 = a^2 + b^2$

$\sqrt{c^2} = \sqrt{4+16}$

$c = \pm\sqrt{20}$

Foci Points:

$(1, -3 \pm \sqrt{20})$

Name _____

y Guide for Quiz #2

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

$(x-h)^2+(y-k)^2=r^2$

1) Center: $(10, 4)$
Radius: 2

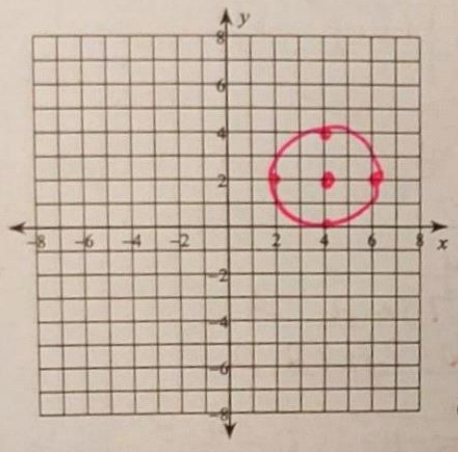
$(x-10)^2+(y-4)^2=4$

2) Center: $(14, -10)$
Radius: $\sqrt{5}$

$(x-14)^2+(y+10)^2=5$

Identify the center and radius of each. Then sketch the graph.

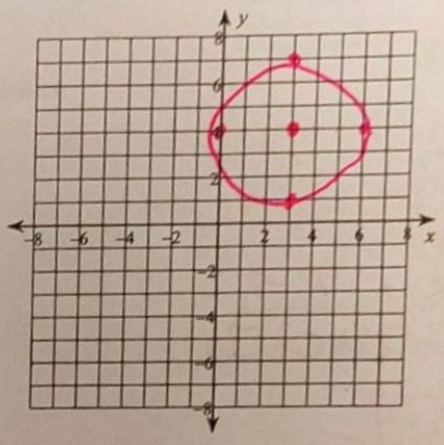
3) $(x-4)^2+(y-2)^2=4$



Center: (4, 2)

Radius: 2

4) $(x-3)^2+(y-4)^2=9$



Center: (3, 4)

Radius: 3

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

$(x-h)^2+(y-k)^2=r^2$

5) Center: $(-5, 9)$
Point on Circle: $(-3, 14)$

① $(x-h)^2+(y-k)^2=r^2$
$(-3+5)^2+(14-9)^2=29$
$(x+5)^2+(y-9)^2=29$

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

6) $x^2+y^2+24x-12y+164=0$

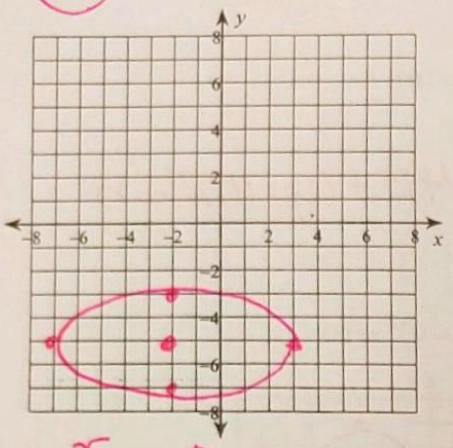
$x^2+24x+144+y^2-12y+36=-164+144+36$
$(x+12)^2+(y-6)^2=16$

7) $4x^2+y^2+32x-16y+64=0$

$4x^2-32x+\_\_+y^2-16y+\_\_=-64+\_\_+\_\_$
$4(x^2-8x+\_\_)+y^2-16y+\_\_=-64+\_\_$
$4(x^2-4x+4)+y^2-16y+64$
$\frac{4(x-2)^2}{16}+\frac{(y-8)^2}{16}=\frac{16}{16}$
$\frac{(x-2)^2}{4}+\frac{(y-8)^2}{16}=1$

Identify the center, vertices, co-vertices, and foci of each. Then sketch the graph.

8) $\frac{(x+2)^2}{25} + \frac{(y+5)^2}{4} = 1$



$a^2 = 25$ $a = 5$

$b^2 = 4$ $b = 2$

Center: $(-2, -5)$

Major Axis: x

Vertices: $(3, -5)$ & $(-7, -5)$

Co-vertices: $(-2, -3)$ & $(-2, -7)$

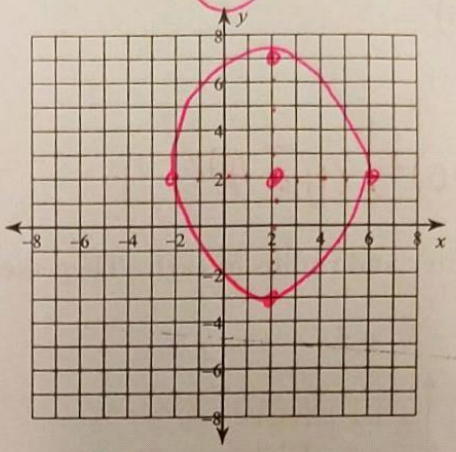
Foci: $c^2 = a^2 - b^2$

$\sqrt{c^2} = \sqrt{25 - 4}$

$c = \pm\sqrt{21}$

Foci Points: $(-2 \pm \sqrt{21}, -5)$

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



$a^2 = 25$ $a = 5$

$b^2 = 16$ $b = 4$

Center: $(2, 2)$

Major Axis: y

Vertices: $(2, 7)$ & $(2, -3)$

Co-vertices: $(6, 2)$ & $(-2, 2)$

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

$\sqrt{c^2} = \sqrt{25 - 16}$ $c = \pm 3$

Foci Points: $(2, 2 \pm 3)$

$(2, 5), (2, -1)$

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

10) Vertices: (11, 7), (−1, 7) x changed, a^2 under x
Co-vertices: (5, 11), (5, 3)

Step 1: $\left(\frac{11+-1}{2}, \frac{7+7}{2}\right)$

$(5, 7)$

Step 2: $a =$ (5, 7) to (11, 7)

$a = 6$ $a^2 = 36$

Step 3: $b =$ (5, 7) to (5, 11)

$b^2 = 4$ $b^2 = 16$

Step 4: $\frac{(x-5)^2}{36} + \frac{(y-7)^2}{16} = 1$

11) Vertices: (−9, 15), (−9, 1) y changed a^2 under y
Co-vertices: (−6, 8), (−12, 8)

Step 1: $\left(\frac{-9+-9}{2}, \frac{15+1}{2}\right)$

$(-9, 8)$

Step 2: $a =$ (−9, 8) to (−9, 15)

$a = 7$ $a^2 = 49$

Step 3: $b =$ (−9, 8) to (−12, 8)

$b = 3$ $b^2 = 9$

Step 4: $\frac{(x+9)^2}{9} + \frac{(y-8)^2}{49} = 1$