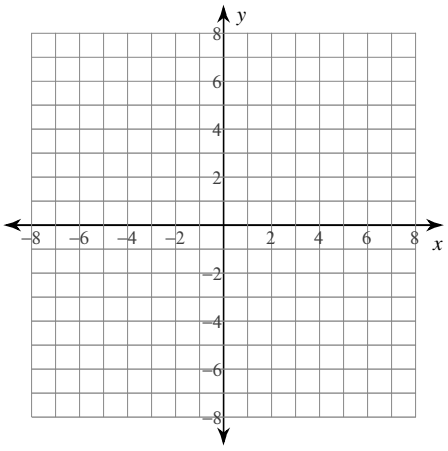
Algebra 2/Trig - Hyperbolas Name_____

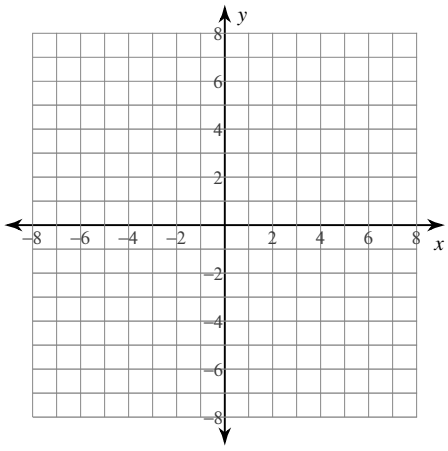
Assignment # _____ Date_____ Period____

Graph each equation.

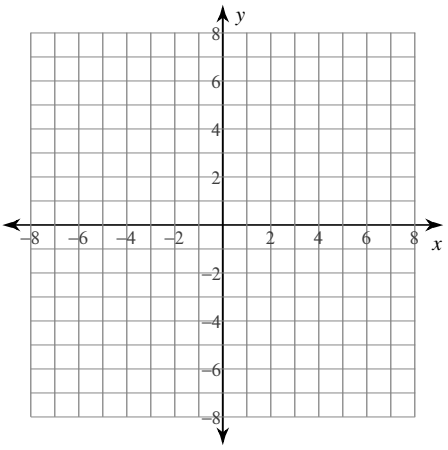
1) $\frac{(x+2)^2}{9} - \frac{(y+1)^2}{16} = 1$



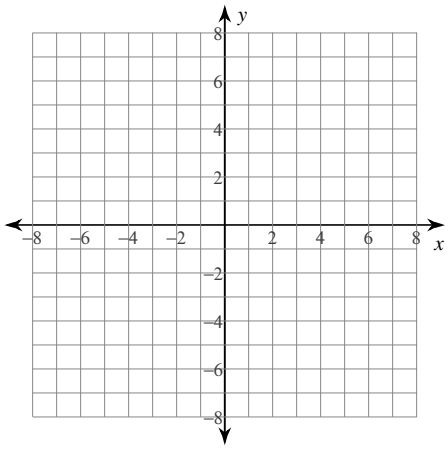
2) $\frac{y^2}{25} - \frac{(x+3)^2}{4} = 1$



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



4) $\frac{(x-1)^2}{15} - \frac{(y+1)^2}{10} = 1$



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

5) $9x^2 - 16y^2 + 162x - 32y + 137 = 0$

6) $-25x^2 + 16y^2 + 224y + 384 = 0$

7) Vertices: $(13, 3), (-5, 3)$

Asymptotes: $y = \frac{4}{3}x - \frac{7}{3}$

$y = -\frac{4}{3}x + \frac{25}{3}$

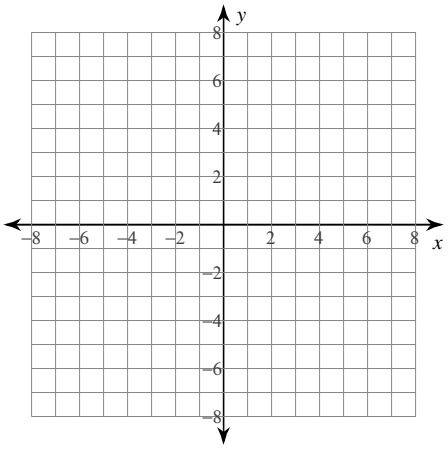
8) Foci: $(-9 + 4\sqrt{5}, 5), (-9 - 4\sqrt{5}, 5)$

Asymptotes: $y = \frac{1}{2}x + \frac{19}{2}$

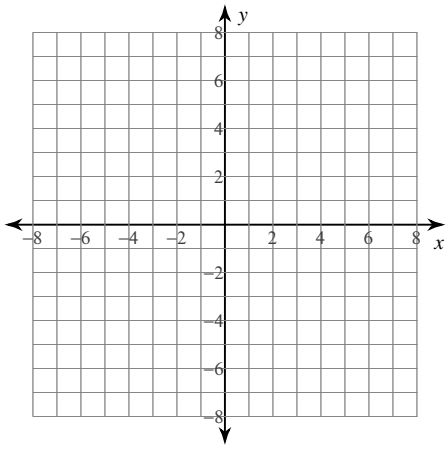
$y = -\frac{1}{2}x + \frac{1}{2}$

Identify the vertices, foci, asymptotes, and direction of opening of each. Then sketch the graph.

9) $\frac{(x+1)^2}{9} - \frac{(y+3)^2}{4} = 1$



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



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

11) Vertices: $(10, 12), (10, 0)$
Foci: $(10, 16), (10, -4)$

12) Vertices: $(9, -6), (-1, -6)$
Foci: $(17, -6), (-9, -6)$

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

13) Vertices: $(-1, 14), (-1, 4)$
Foci: $(-1, 13), (-1, 5)$

14) Vertices: $(6, 1), (-4, 1)$
Foci: $(4, 1), (-2, 1)$

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

15) $x^2 + y^2 + 30x - 12y + 252 = 0$

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

16) $x = -4y^2 + 80y - 404$

17) $y = -\frac{1}{19}x^2 - \frac{4}{19}x - \frac{99}{19}$

18) Focus: $\left(-\frac{15}{4}, 10\right)$, Directrix: $x = -\frac{17}{4}$

19) Focus: $\left(7, \frac{181}{20}\right)$, Directrix: $y = \frac{179}{20}$

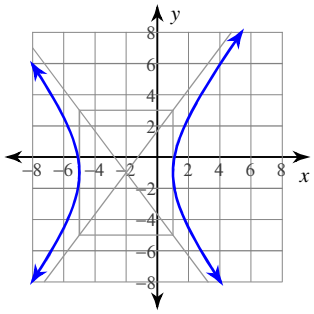
Use the information provided to write the standard form equation of each circle.

20) Center lies in the first quadrant
Tangent to $x = 9$, $y = 2$, and $x = 19$

21) Three points on the circle:
$(-7, 17)$, $(9, 9)$, and $(-13, 11)$

Answers to Assignment # _____ (ID: 1)

1)



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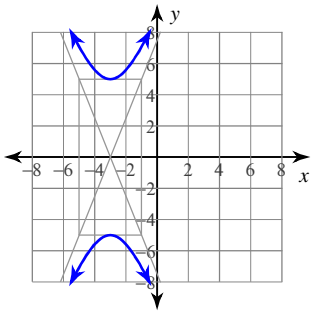

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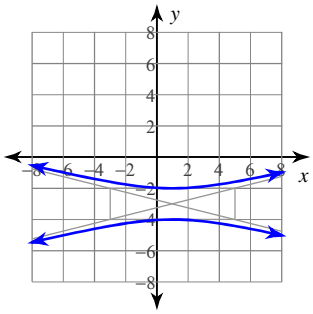

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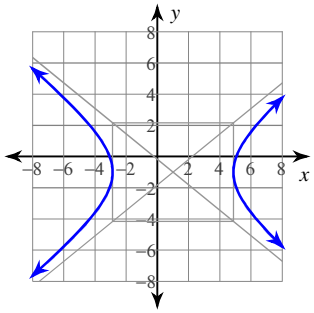


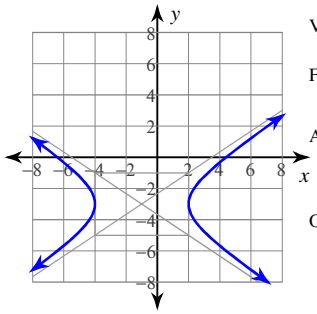
5) $\frac{(x+9)^2}{64} - \frac{(y+1)^2}{36} = 1$

6) $\frac{(y+7)^2}{25} - \frac{x^2}{16} = 1$

7) $\frac{(x-4)^2}{81} - \frac{(y-3)^2}{144} = 1$

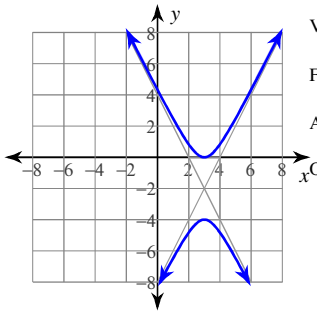
8) $\frac{(x+9)^2}{64} - \frac{(y-5)^2}{16} = 1$

9)



Vertices: $(2, -3)$
$(-4, -3)$
Foci: $(-1 + \sqrt{13}, -3)$
$(-1 - \sqrt{13}, -3)$
Asym.: $y = \frac{2}{3}x - \frac{7}{3}$
$y = -\frac{2}{3}x - \frac{11}{3}$
Opens left/right

10)



Vertices: $(3, 0)$
$(3, -4)$
Foci: $(3, -2 + \sqrt{5})$
$(3, -2 - \sqrt{5})$
Asym.: $y = 2x - 8$
$y = -2x + 4$
Opens up/down

11) $\frac{(y-6)^2}{36} - \frac{(x-10)^2}{64} = 1$

12) $\frac{(x-4)^2}{25} - \frac{(y+6)^2}{144} = 1$

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

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

15) $(x+15)^2 + (y-6)^2 = 9$

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

17) $-19(y+5) = (x+2)^2$

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

19) $\frac{1}{5}(y-9) = (x-7)^2$

20) $(x-14)^2 + (y-7)^2 = 25$

21) $\left(x + \frac{7}{3}\right)^2 + \left(y - \frac{19}{3}\right)^2 = \frac{1220}{9}$