Precalculus Name_____ ID: 1

Unit 1 and 2 Exam Review

Date_____ Period____

Simplify. Write "undefined" for expressions that are undefined.

1) $\begin{bmatrix} -2 & 3 \end{bmatrix} + \begin{bmatrix} 2 & 6 \end{bmatrix}$

2) $\begin{bmatrix} -2 & 6 & -6 \\ 5 & -6 & -5 \end{bmatrix} - \left(\begin{bmatrix} 4 & -6 & 6 \\ 1 & 3 & -5 \end{bmatrix} + \begin{bmatrix} -2 & 4 & -3 \\ -1 & -4 & 5 \end{bmatrix} \right)$

3) $-5 \begin{bmatrix} -5 & -4 \\ 0 & 6 \\ -4 & -4 \end{bmatrix}$

4) $\begin{bmatrix} -3 & -1 \\ -2 & 2 \end{bmatrix} \cdot \begin{bmatrix} 5 & 0 \\ -4 & 1 \end{bmatrix}$

5) $2 \begin{bmatrix} 6 & 5 & 5 & 3 \end{bmatrix}$

6) $\begin{bmatrix} -4 \\ -3 \\ -2 \\ 6 \end{bmatrix} - \begin{bmatrix} 4 \\ 6 \\ 4 \\ 4 \end{bmatrix}$

7) $\begin{bmatrix} 6 & -4 \\ 4 & -1 \end{bmatrix} \cdot \begin{bmatrix} 6 & 4 & 4 \\ -2 & -6 & 2 \end{bmatrix}$

Evaluate each determinant.

8) $\begin{vmatrix} -3 & 4 \\ 2 & 3 \end{vmatrix}$

9) $\begin{vmatrix} -5 & -2 & 4 \\ 4 & 3 & 3 \\ 5 & -5 & -5 \end{vmatrix}$

Solve each equation or state if there is no unique solution.

10) $\begin{bmatrix} -1 \\ -3 \end{bmatrix} = Z - \begin{bmatrix} -10 \\ 10 \end{bmatrix}$

11) $\begin{bmatrix} 1 \\ -7 \end{bmatrix} = \begin{bmatrix} 2 & 4 \\ 0 & -4 \end{bmatrix} X + \begin{bmatrix} -1 \\ 5 \end{bmatrix}$

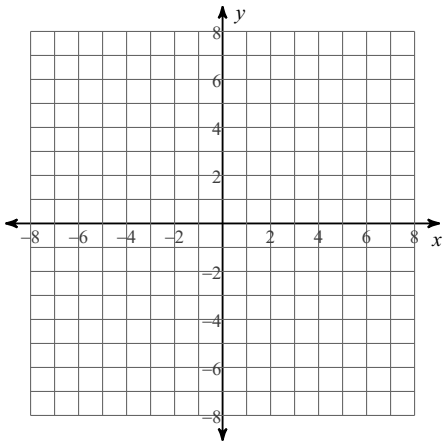
Find the inverse of each matrix.

12) $\begin{bmatrix} -7 & 7 \\ 8 & 4 \end{bmatrix}$

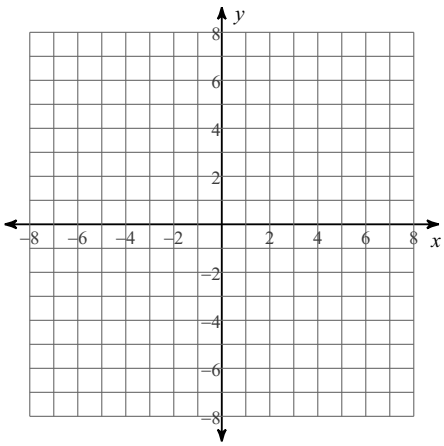
13) $\begin{bmatrix} -5 & -2 & -3 \\ -5 & -5 & -3 \\ 5 & 4 & -3 \end{bmatrix}$

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

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



15) $x^2 + y^2 + 4x + 6y + 4 = 0$



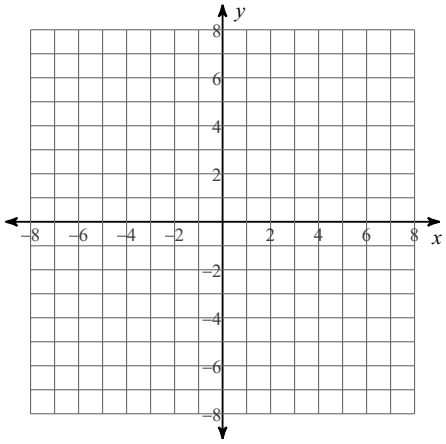
Use the information provided to write the standard form equation of each circle.

16) Center: $(-11, 0)$
Radius: 5

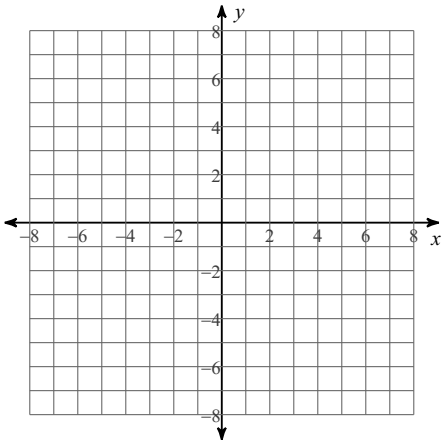
17) Center: $(17, 10)$
Point on Circle: $(19, 10)$

Identify the vertex, focus, and axis of symmetry of each. Then sketch the graph.

18) $-(x+1) = (y+5)^2$



19) $x^2 - 12x + 4y + 32 = 0$

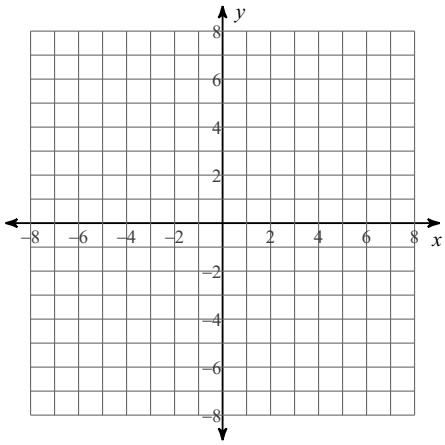


Use the information provided to write the transformational form equation of each parabola.

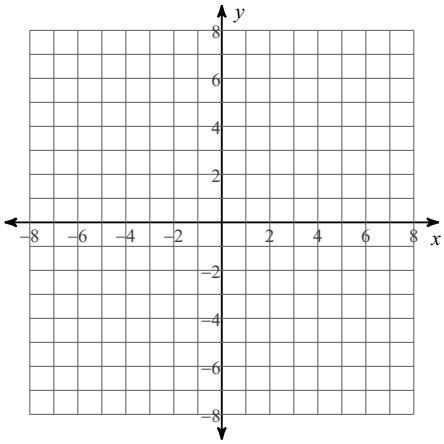
20) Vertex: $(2, -8)$, Focus: $(2, -9)$

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

21) $\dfrac{x^2}{49} + \dfrac{(y-2)^2}{25} = 1$



22) $49x^2 + 4y^2 + 294x + 245 = 0$

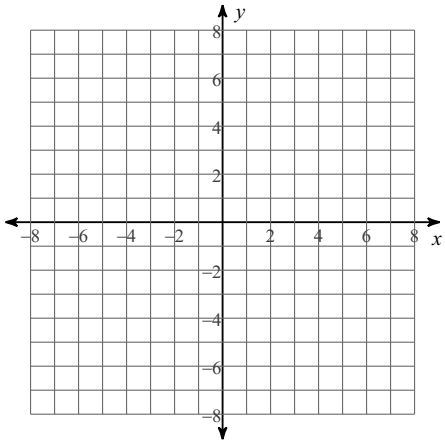


Use the information provided to write the standard form equation of each ellipse.

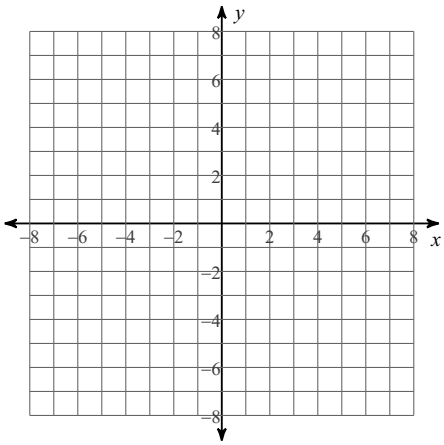
23) Center: $(7, 4)$
Vertex: $(7, 15)$
Co-vertex: $(15, 4)$

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

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



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



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Simplify. Write "undefined" for expressions that are undefined.

1) $\begin{bmatrix} -2 & 3 \end{bmatrix} + \begin{bmatrix} 2 & 6 \end{bmatrix}$

$\begin{bmatrix} 0 & 9 \end{bmatrix}$

2) $\begin{bmatrix} -2 & 6 & -6 \\ 5 & -6 & -5 \end{bmatrix} - \left(\begin{bmatrix} 4 & -6 & 6 \\ 1 & 3 & -5 \end{bmatrix} + \begin{bmatrix} -2 & 4 & -3 \\ -1 & -4 & 5 \end{bmatrix} \right)$

$\begin{bmatrix} -4 & 8 & -9 \\ 5 & -5 & -5 \end{bmatrix}$

3) $-5 \begin{bmatrix} -5 & -4 \\ 0 & 6 \\ -4 & -4 \end{bmatrix}$

$\begin{bmatrix} 25 & 20 \\ 0 & -30 \\ 20 & 20 \end{bmatrix}$

4) $\begin{bmatrix} -3 & -1 \\ -2 & 2 \end{bmatrix} \cdot \begin{bmatrix} 5 & 0 \\ -4 & 1 \end{bmatrix}$

$\begin{bmatrix} -11 & -1 \\ -18 & 2 \end{bmatrix}$

5) $2 \begin{bmatrix} 6 & 5 & 5 & 3 \end{bmatrix}$

$\begin{bmatrix} 12 & 10 & 10 & 6 \end{bmatrix}$

6) $\begin{bmatrix} -4 \\ -3 \\ -2 \\ 6 \end{bmatrix} - \begin{bmatrix} 4 \\ 6 \\ 4 \\ 4 \end{bmatrix}$

$\begin{bmatrix} -8 \\ -9 \\ -6 \\ 2 \end{bmatrix}$

7) $\begin{bmatrix} 6 & -4 \\ 4 & -1 \end{bmatrix} \cdot \begin{bmatrix} 6 & 4 & 4 \\ -2 & -6 & 2 \end{bmatrix}$

$\begin{bmatrix} 44 & 48 & 16 \\ 26 & 22 & 14 \end{bmatrix}$

Evaluate each determinant.

8) $\begin{vmatrix} -3 & 4 \\ 2 & 3 \end{vmatrix}$

-17

9) $\begin{vmatrix} -5 & -2 & 4 \\ 4 & 3 & 3 \\ 5 & -5 & -5 \end{vmatrix}$

-210

Solve each equation or state if there is no unique solution.

10) $\begin{bmatrix} -1 \\ -3 \end{bmatrix} = Z - \begin{bmatrix} -10 \\ 10 \end{bmatrix}$

$\begin{bmatrix} -11 \\ 7 \end{bmatrix}$

11) $\begin{bmatrix} 1 \\ -7 \end{bmatrix} = \begin{bmatrix} 2 & 4 \\ 0 & -4 \end{bmatrix} X + \begin{bmatrix} -1 \\ 5 \end{bmatrix}$

$\begin{bmatrix} -5 \\ 3 \end{bmatrix}$

Find the inverse of each matrix.

12) $\begin{bmatrix} -7 & 7 \\ 8 & 4 \end{bmatrix}$

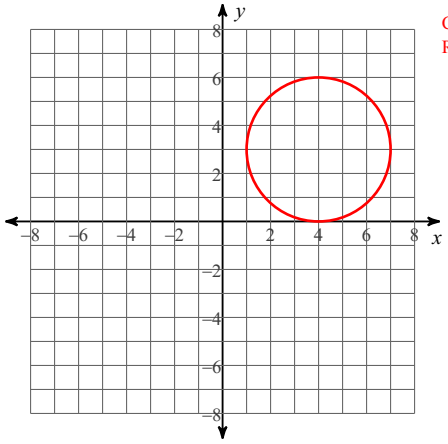
$-\frac{1}{84} \cdot \begin{bmatrix} 4 & -7 \\ -8 & -7 \end{bmatrix}$

13) $\begin{bmatrix} -5 & -2 & -3 \\ -5 & -5 & -3 \\ 5 & 4 & -3 \end{bmatrix}$

$-\frac{1}{90} \cdot \begin{bmatrix} 27 & -18 & -9 \\ -30 & 30 & 0 \\ 5 & 10 & 15 \end{bmatrix}$

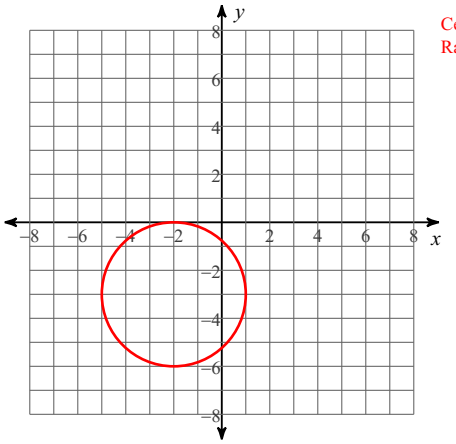
Identify the center and radius of each. Then sketch the graph.

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



Center: $(4, 3)$
Radius: 3

15) $x^2 + y^2 + 4x + 6y + 4 = 0$



Center: $(-2, -3)$
Radius: 3

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

16) Center: $(-11, 0)$
Radius: 5

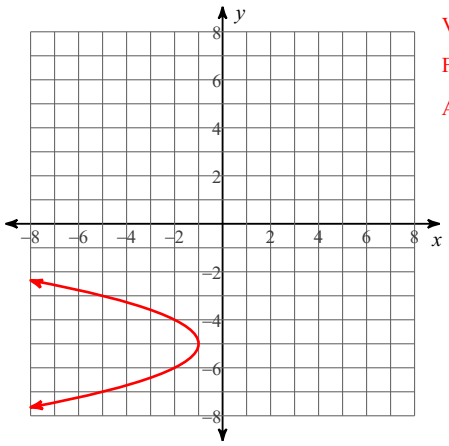
$(x+11)^2 + y^2 = 25$

17) Center: $(17, 10)$
Point on Circle: $(19, 10)$

$(x-17)^2 + (y-10)^2 = 4$

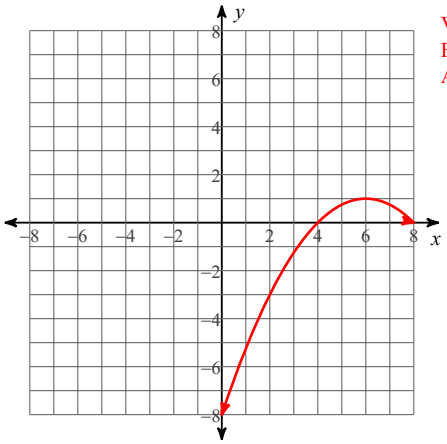
Identify the vertex, focus, and axis of symmetry of each. Then sketch the graph.

18) $-(x+1) = (y+5)^2$



Vertex: $(-1, -5)$
Focus: $\left(-\frac{5}{4}, -5\right)$
Axis of Sym.: $y = -5$

19) $x^2 - 12x + 4y + 32 = 0$



Vertex: $(6, 1)$
Focus: $(6, 0)$
Axis of Sym.: $x = 6$

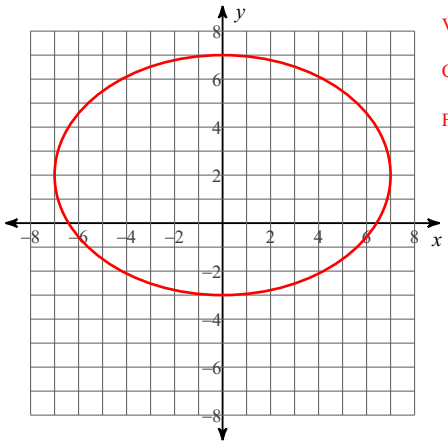
Use the information provided to write the transformational form equation of each parabola.

20) Vertex: $(2, -8)$, Focus: $(2, -9)$

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

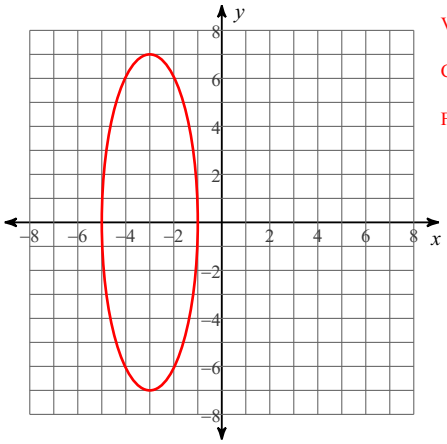
Identify the vertices, co-vertices, and foci of each. Then sketch the graph.

21) $\dfrac{x^2}{49} + \dfrac{(y-2)^2}{25} = 1$



Vertices: $(7, 2)$
$(-7, 2)$
Co-vertices: $(0, 7)$
$(0, -3)$
Foci: $(2\sqrt{6}, 2)$
$(-2\sqrt{6}, 2)$

22) $49x^2 + 4y^2 + 294x + 245 = 0$



Vertices: $(-3, 7)$
$(-3, -7)$
Co-vertices: $(-1, 0)$
$(-5, 0)$
Foci: $(-3, 3\sqrt{5})$
$(-3, -3\sqrt{5})$

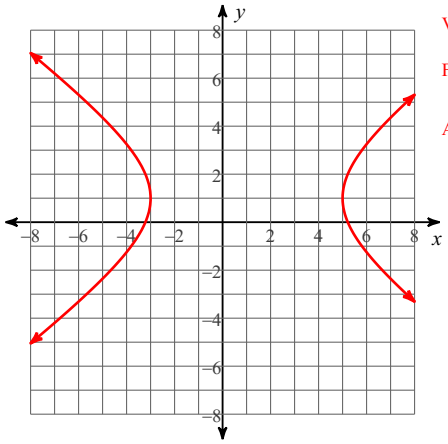
Use the information provided to write the standard form equation of each ellipse.

23) Center: $(7, 4)$
Vertex: $(7, 15)$
Co-vertex: $(15, 4)$

$$\frac{(x-7)^2}{64} + \frac{(y-4)^2}{121} = 1$$

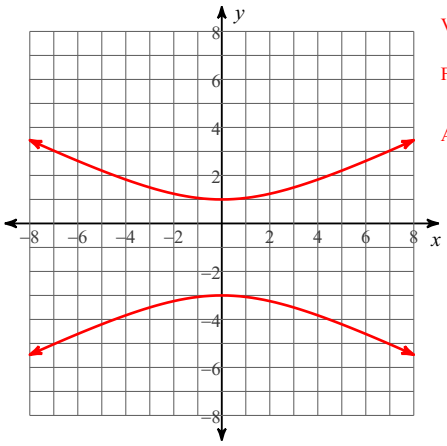
Identify the vertices, foci, and asymptotes of each. Then sketch the graph.

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



Vertices: $(5, 1)$
$(-3, 1)$
Foci: $(6, 1)$
$(-4, 1)$
Asym.: $y = \frac{3}{4}x + \frac{1}{4}$
$y = -\frac{3}{4}x + \frac{7}{4}$

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



Vertices: $(0, 1)$
$(0, -3)$
Foci: $(0, -1 + 2\sqrt{5})$
$(0, -1 - 2\sqrt{5})$
Asym.: $y = \frac{1}{2}x - 1$
$y = -\frac{1}{2}x - 1$