

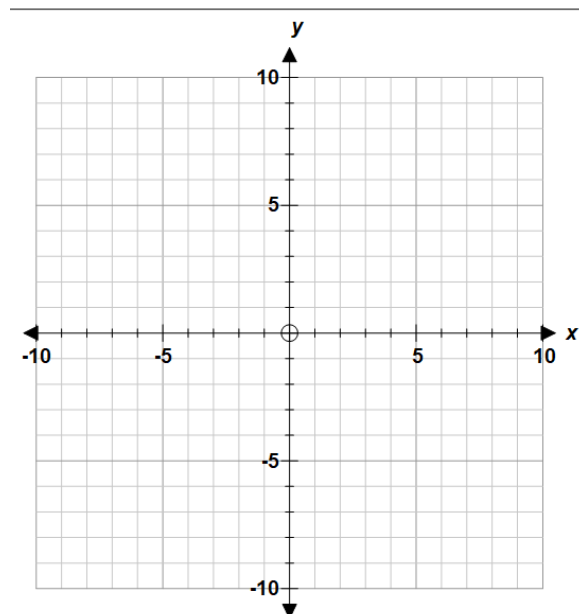
Student Name : Date : / / 2024 Grade 12 -G ()

Parabola القطع المكافئ**Q1:** Write each equation in standard form. Identify the vertex, axis of symmetry, and direction of opening of the parabola.

اكتب كل معادلة بالصيغة القياسية. حدد رأس القطع المكافئ ومحور تماثله واتجاه فتحته.

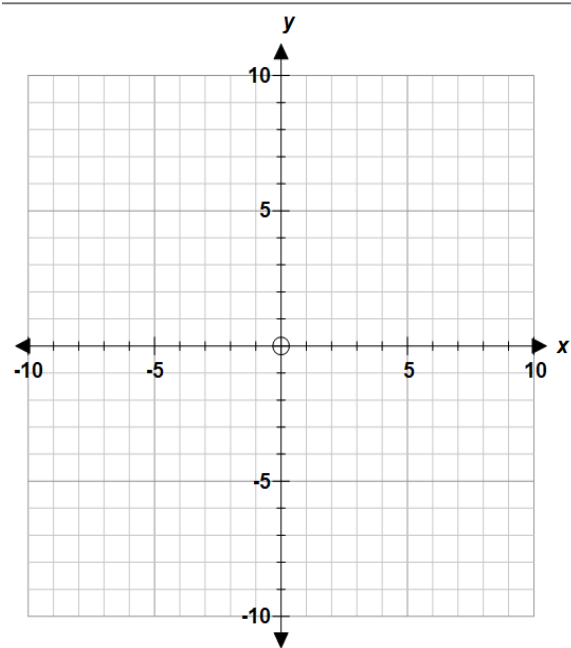
1) $y = -2(x + 1)^2 + 3$

1	Direction of Opening اتجاه الفتحة	
2	Vertex الرأس	
3	Axis of symmetry محور التماثل	
4	Focus البؤرة	
5	Directrix الدليل	
6	Length of Latus Rectum طول الوتر البؤري	



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

1	Direction of Opening اتجاه الفتحة	
2	Vertex الرأس	
3	Axis of symmetry محور التماثل	
4	Focus البؤرة	
5	Directrix الدليل	
6	Length of Latus Rectum طول الوتر البؤري	



3) $y = 2x^2 - 12x + 6$

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

Q2:

Write an equation for each parabola described below. Then graph the equation.

1. vertex (1, 3), focus (1, 5)

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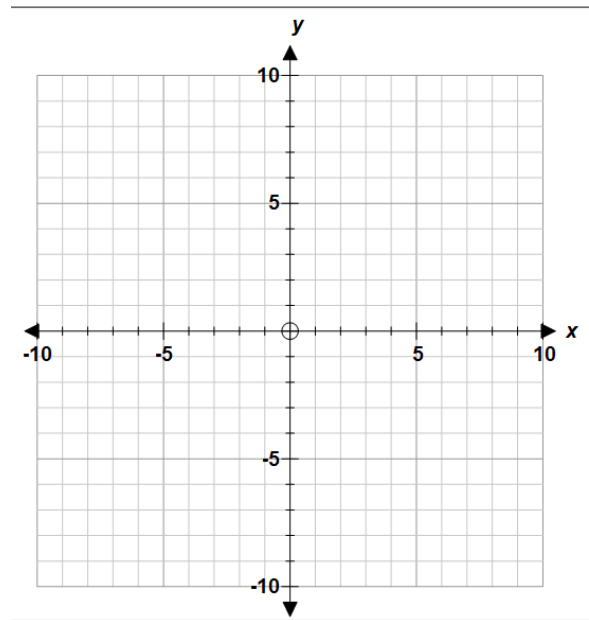
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2. focus $(5, 6)$, directrix $x = -2$

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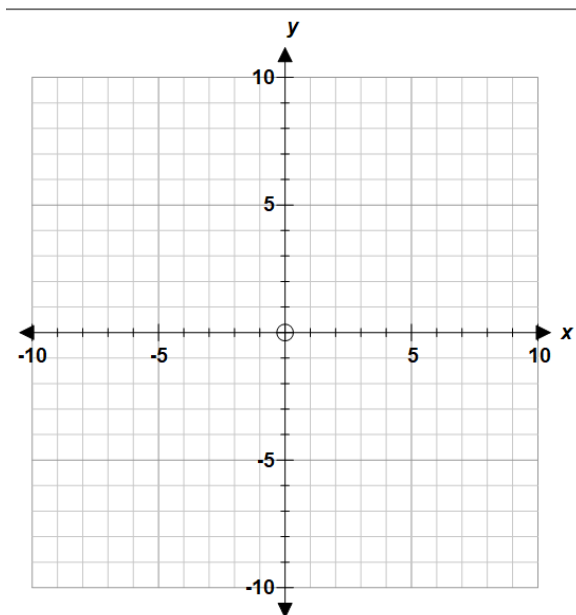
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3. vertex at $(-2, -4)$ and directrix $y = 1$.

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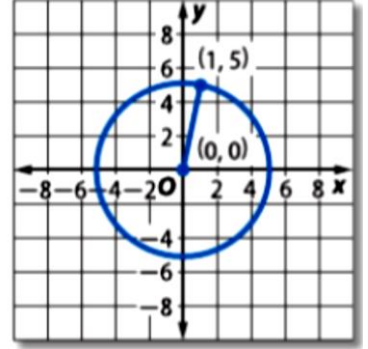
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الدائرة Circle

Q3:

Write an equation for the graph.



1.

Write an equation for a circle if the endpoints of a diameter are at (7, 6) and (−1, −8).

Find the center and radius of the circle with equation

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

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

4. $(y + 5)^2 + (x - 4)^2 = 49$

5. $x^2 + y^2 + 4x - 10y - 7 = 0$

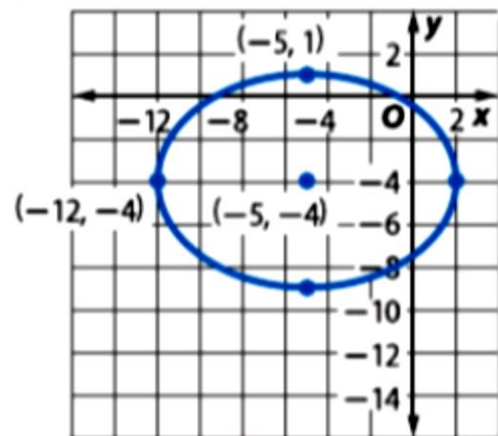
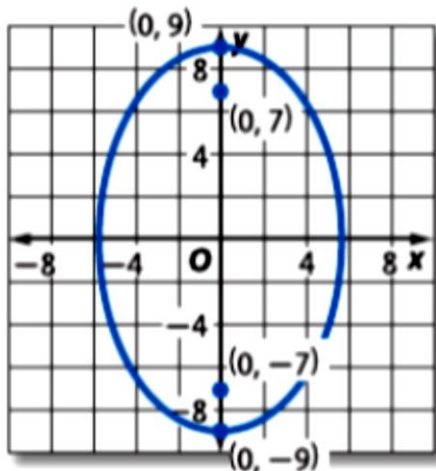
Ellipses

القطع الناقص

Q1:

Write an equation for the ellipse.

1



2

Write an equation for an ellipse with vertices at $(-4, 0)$ and $(4, 0)$ and foci at $(2, 0)$ and $(-2, 0)$.

3 Write an equation for the ellipse with vertices at $(6, -8)$ and $(6, 4)$ and co-vertices at $(3, -2)$ and $(9, -2)$.

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4 Write an equation for the ellipse with vertices at $(-3, 8)$ and $(9, 8)$ and co-vertices at $(3, 12)$ and $(3, 4)$.

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Write an equation for an ellipse that satisfies each set of conditions.

5 center at $(-2, 6)$, vertex at $(-2, 16)$, co-vertex at $(1, 6)$

6

MODELING The opening of a tunnel in the mountains can be modeled by semiellipses, or halves of ellipses. If the opening is 14.6 meters wide and 8.6 meters high, determine an equation to represent the opening with the center at the origin.



7

Find the coordinates of the center and foci, and the lengths of the major and minor axes of an ellipse with equation $25x^2 + 9y^2 + 250x - 36y + 436 = 0$. Then graph the ellipse.

8

$$9x^2 + 25y^2 + 72x - 150y + 144 = 0$$

9

This image shows a full page of white paper with horizontal blue or grey ruling lines. The lines are evenly spaced and run across the width of the page, providing a template for writing. There are no margins, text, or other markings on the page.

Find the coordinates of the center and foci and the lengths of the major and minor axes for the ellipse with the given equation. Then graph the ellipse.

10

$$4x^2 + y^2 - 32x - 4y + 52 = 0$$

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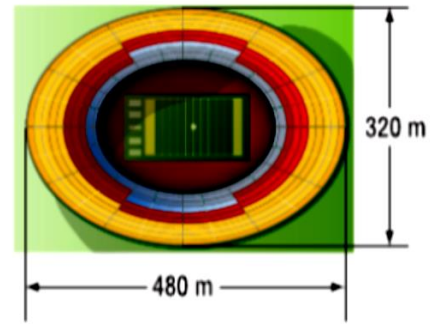
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SENSE-MAKING An architectural firm sent a proposal to a city for building a coliseum, shown at the right.

- Determine the values of a and b .
- Assuming that the center is at the origin, write an equation to represent the ellipse.
- Determine the coordinates of the foci.



12

ERROR ANALYSIS Shayma and Maha are determining the equation for an ellipse with foci at $(-4, -11)$ and $(-4, 5)$ and co-vertices at $(2, -3)$ and $(-10, -3)$. Is either of them correct? Explain your reasoning.

Shayma

$$\frac{(x-4)^2}{64} + \frac{(y+3)^2}{36} = 1$$

Maha

$$\frac{(x+4)^2}{100} + \frac{(y+3)^2}{36} = 1$$

Hyperbolas

القطع الزائد

1 Graph $\frac{(x-3)^2}{4} - \frac{(y+2)^2}{16} = 1$. Identify the vertices, foci, and asymptotes.

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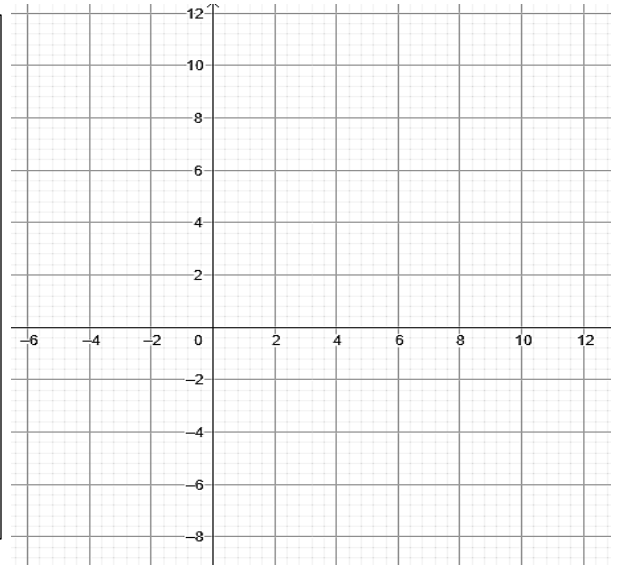
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Graph $\frac{(y-4)^2}{9} - \frac{(x+3)^2}{25} = 1$. Identify the vertices, foci, and asymptotes.

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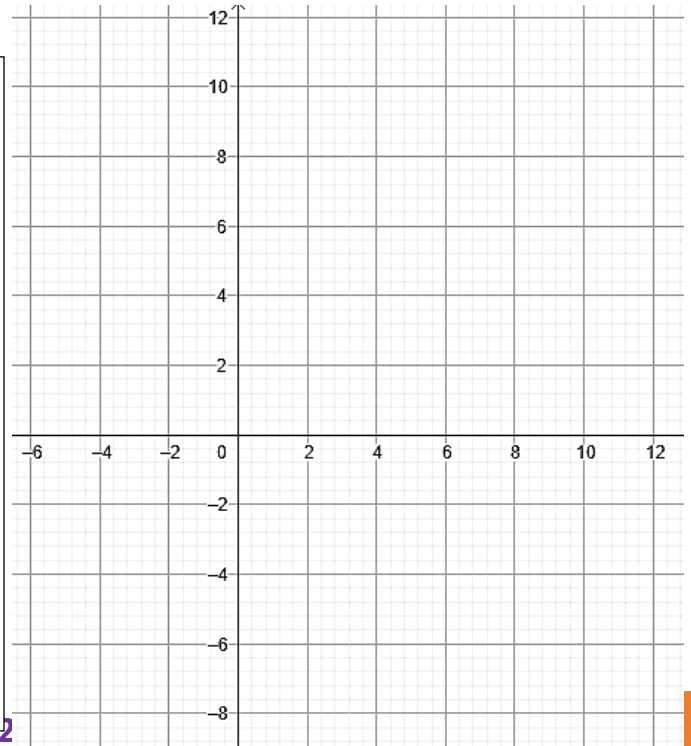
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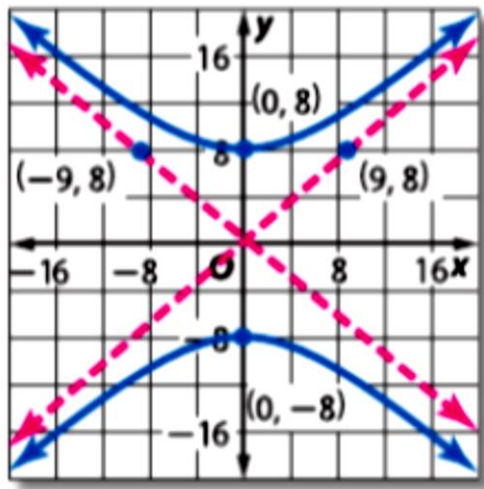
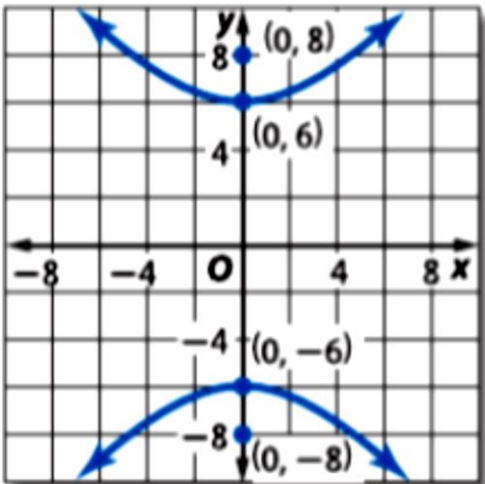
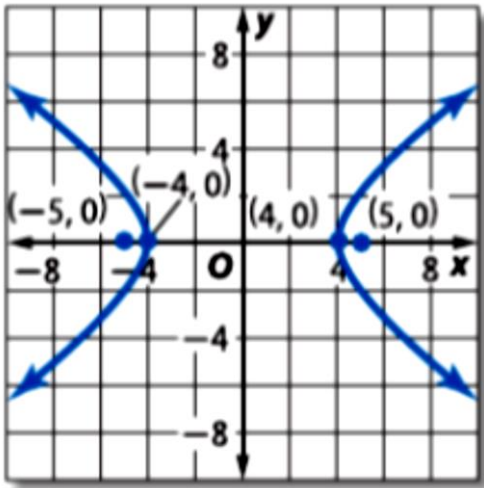
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Write an equation for the hyperbola shown in the graph.



Write an equation for a hyperbola with vertices at $(6, 0)$ and $(-6, 0)$ and foci at $(8, 0)$ and $(-8, 0)$.

The asymptotes for a vertical hyperbola are $y = \frac{5}{3}x$ and $y = -\frac{5}{3}x$ and the vertices are at $(0, 5)$ and $(0, -5)$. Write the equation for the hyperbola.

The asymptotes for a horizontal hyperbola are $y = \frac{7}{9}x$ and $y = -\frac{7}{9}x$. The vertices are $(9, 0)$ and $(-9, 0)$. Write an equation for the hyperbola.

Graph each hyperbola. Identify the vertices, foci, and asymptotes.

$$9y^2 - 4x^2 - 54y + 32x - 19 = 0$$

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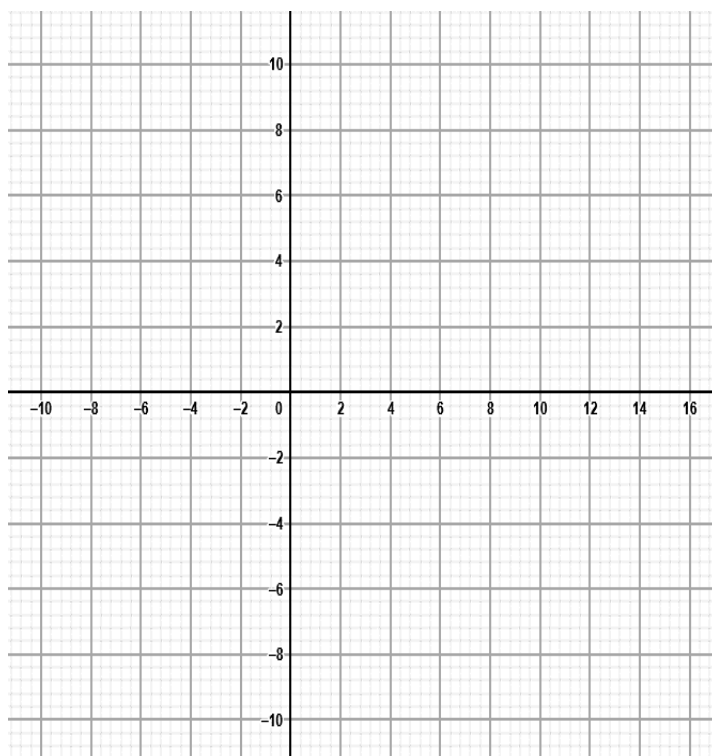
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$$16x^2 - 9y^2 + 128x + 36y + 76 = 0$$

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