

Use the equation of this ellipse to answer questions 1 through 4.

$$\frac{(x + 7)^2}{4} + \frac{(y - 3)^2}{25} = 1$$

1) What are the coordinates of the center of this ellipse?

- (A) (7, -3) (B) (-7, 3) (C) (4, 25) (D) (2, 5)

2) What is the length of the major axis? (Hint: 2a)

- (A) 4 (B) 8 (C) 10 (D) 50

3) What are the coordinates of the foci?

- (A) $(-7 \pm \sqrt{21}, 3)$ (B) $(-7, 3 \pm \sqrt{21})$ (C) $(-7 \pm \sqrt{29}, 3)$ (D) $(-7, 3 \pm \sqrt{29})$

4) What are the vertices of the ellipse?

- (A) (-9,3) & (-5,3) (B) (-7, 8) & (-7,-2) (C) (-7,5) & (-7,1) (D) (-2, 3) & (-12,3)

Use the equation of this hyperbola to answer questions 5 through 8.

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

5) Which axis is the transverse axis?

- (A) x-axis (B) y-axis (C) origin (D) (5,1)

6) What is the distance between the vertices? (Hint: 2a)

- (A) 4 (B) 6 (C) 8 (D) 9

7) What are the covertices of the hyperbola?

- (A) (8, 1) & (2,1) (B) (9, 1) & (1,1) (C) (5, 5) & (5,-3) (D) (5, 4) & (5,-2)

8) What are the foci points of the hyperbola?

- (A) (5,6) & (5,-4) (B) (10, 1) & (0,1) (C) (0, -1) & (-10,1) (D) (-5, 4) & (-5,4)

9) Which of these conic sections is a hyperbola?

- (A) $x^2 + 4x + y^2 - 6y = 0$ (B) $4x^2 + 4x + 3y^2 - 12y - 2 = 0$
 (C) $3x^2 + 6x - 4y - 5 = 0$ (D) $x^2 - 2y^2 + 8y - 6 = 0$

10) Which of these conic sections is a circle?

(A) $x^2 + 4x + y^2 - 6y = 0$

(B) $4x^2 + 4x + 3y^2 - 12y - 2 = 0$

(C) $3x^2 + 6x - 4y - 5 = 0$

(D) $x^2 - 2y^2 + 8y - 6 = 0$

11) Which of these conic sections is an ellipse?

(A) $x^2 + 4x + y^2 - 6y = 0$

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12) Which of these conic sections is a parabola?

(A) $x^2 + 4x + y^2 - 6y = 0$

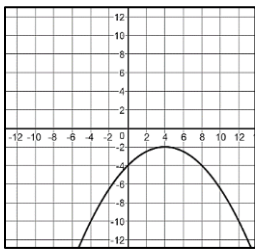
(B) $4x^2 + 4x + 3y^2 - 12y - 2 = 0$

(C) $3x^2 + 6x - 4y - 5 = 0$

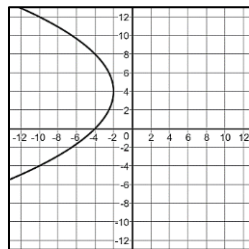
(D) $x^2 - 2y^2 + 8y - 6 = 0$

13) Which of these is the graph of $(x - 4)^2 = 4(-2)(y + 2)$?

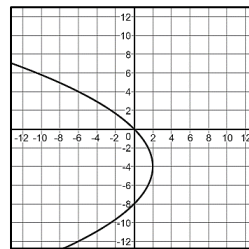
(A)



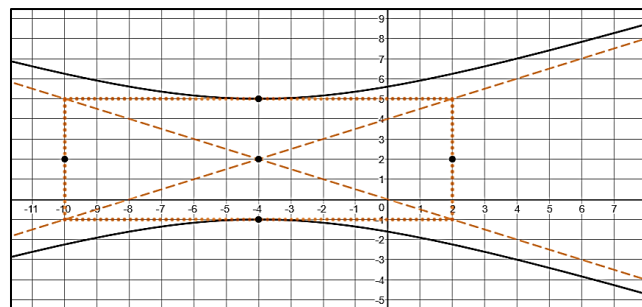
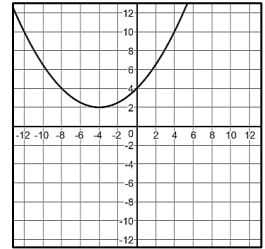
(B)



(C)



(D)



14) Which of these is the equation of the hyperbola shown in the graph above?

(A) $\frac{(x-4)^2}{36} - \frac{(y+2)^2}{9} = 1$

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

(C) $\frac{(y-2)^2}{9} - \frac{(x+4)^2}{36} = 1$

(D) $\frac{(y-4)^2}{6} - \frac{(x+2)^2}{3} = 1$

15) Rewrite the equation of this conic section in standard form.

$$x^2 + y^2 + 8x - 6y - 5 = 0$$

(A) $(x + 4)^2 + (y - 3)^2 = 30$

(B) $(x + 8)^2 + (y - 6)^2 = 5$

(C) $(x + 3)^2 + (y + 4)^2 = 10$

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

Use the equation of this parabola to answer questions 16 through 20

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

16) How does the parabola open?

- (A) up (B) down (C) Right (D) Left

17) What are the coordinates of the vertex?

- (A) (-4,2) (B) (4,2) (C) (-2,4) (D) (2,-4)

18) What is the value of p?

- (A) 2 (B) 4 (C) 1 (D) 8

19) What are the coordinates of the focus?

- (A) (-6,2) (B) (-2,2) (C) (0,-4) (D) (4,-4)

20) What is the equation of the directrix of the parabola?

- (A) $x = 0$ (B) $x = -6$ (C) $y = 0$ (D) $y = -6$

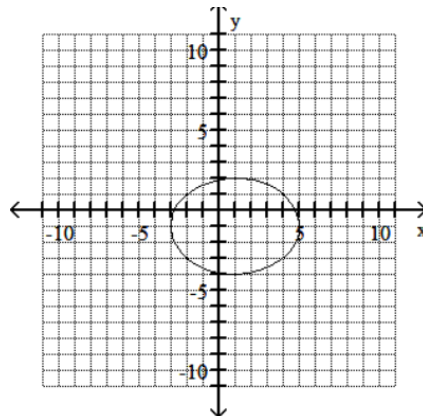
21) Find the equation of the parabola with the vertex at (-3,2) and focus at (-3,-1). (Hint: Sketch it)

- (A) $(y + 2)^2 = 4(-3)(x - 3)$ (B) $(x + 3)^2 = 4(-3)(y - 2)$
(C) $(y - 2)^2 = 4(-3)(x + 3)$ (D) $(x - 3)^2 = 4(-3)(y + 2)$

22) Find the center and radius of the circle with the equation $(x + 2)^2 + (y - 3)^2 = 41$.

- (A) (-2,3); $\sqrt{41}$ (B) (-2,3), 41 (C) (2,-3); $\sqrt{41}$ (D) (2,-3); 41

23) Which is the equation to the graph of the ellipse?



- (A) $\frac{(x-1)^2}{16} + \frac{(y+1)^2}{9} = 1$ (B) $\frac{(x-1)^2}{9} + \frac{(y+1)^2}{16} = 1$ (C) $\frac{(x-1)^2}{16} - \frac{(y+1)^2}{9} = 1$ (D) $\frac{(x-1)^2}{9} - \frac{(y+1)^2}{16} = 1$
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Free Response

24. Fill in the missing characteristics and then graph the hyperbola,

$$\frac{(y-1)^2}{25} - \frac{(x+2)^2}{36} = 1$$

Center: (____, ____)

$a^2 =$ ____ $a =$ ____

$b^2 =$ ____ $b =$ ____

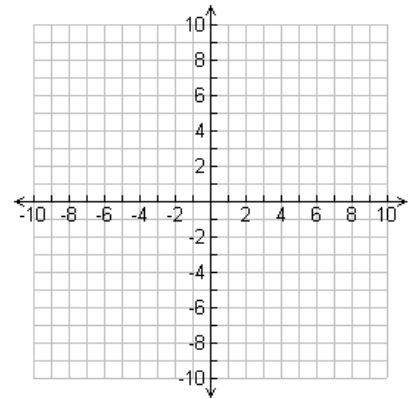
Transverse axis: ____

Vertices: (____, ____) & (____, ____)

Co-Vertices: (____, ____) & (____, ____)

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

Foci Points:



25. Fill in the missing characteristics and then graph the parabola

$$(y + 3)^2 = 4(4)(x + 1)$$

Opens ____

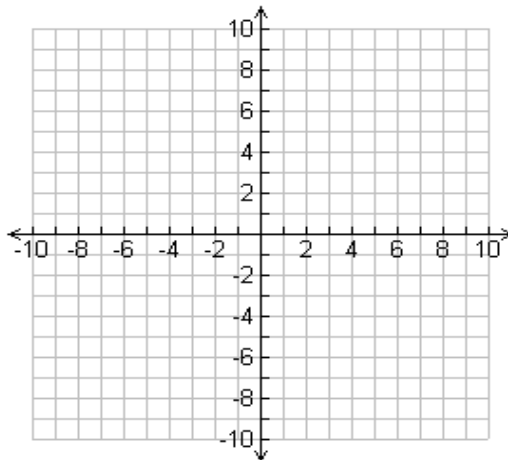
Vertex: ____

$P =$ ____

Axis of Symmetry: ____ = ____

Focus: (____, ____)

Directrix: ____ = ____



26. Write the equation of the ellipse which has vertices at (2, 2) and (12, 2) and has a covertices at (7, -1) and (7, 5).

Step 1: center:

Step 2: $a =$

Step 3: $b =$

Step 4: Equation:

27) Write the equation of a hyperbola which has vertices (8,2) & (8,-6) and foci at (8,3) & (8,-7).

Step 1: transverse axis:

Step 3: a = Center \rightarrow Vertex

Step 5: $c^2 = a^2 + b^2$

Step 2: Center:

Step 4: c = Center \rightarrow Foci

Step 6: Equation:

Identify each conic section AND write its equation in standard form.

28) $x^2 - 4x + y^2 + 10y + 25 = 0$

29) $25x^2 - 150x + 4y^2 + 8y + 129 = 0$

30) ~~$y^2 + 2y - 20x + 41 = 0$~~

Parabola

31) $x^2 - 2y^2 + 8y - 6 = 0$