

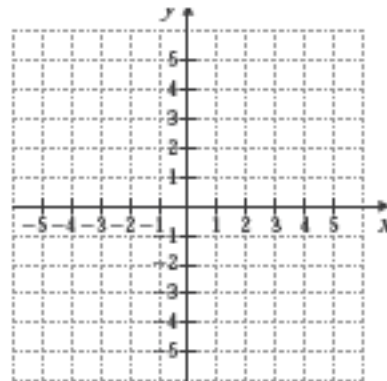
1. $(y+2)^2=8(x+2)$

Opens:

Vertex: _____

Axis of Symmetry: _____

x-Intercepts $y = 0$



y-Intercepts $x = 0$

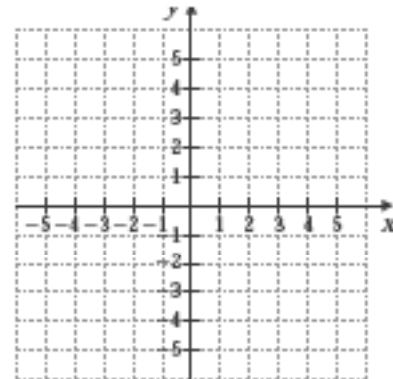
2. $(x+2)^2 = -5(y-1)$

Opens:

Vertex: _____

Axis of Symmetry: _____

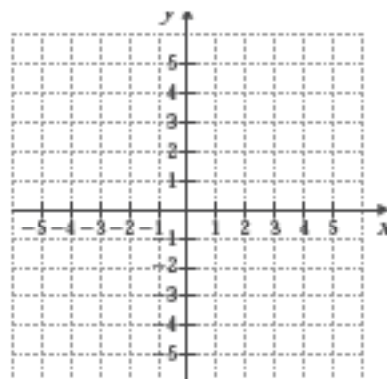
x-Intercepts $y = 0$



y-Intercepts $x = 0$

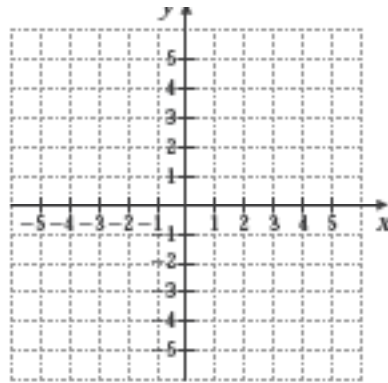
3.

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



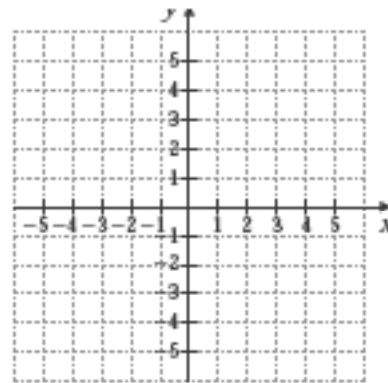
4.

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



5.

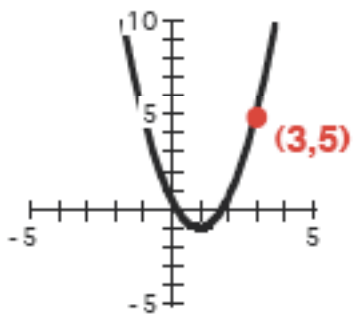
Graph: $\frac{(y-2)^2}{4} - \frac{(x+2)^2}{9} = 1$



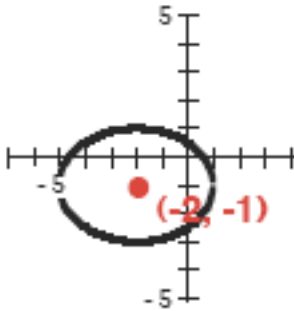
6.

Find the equation in standard form for the parabola with the following characteristics:

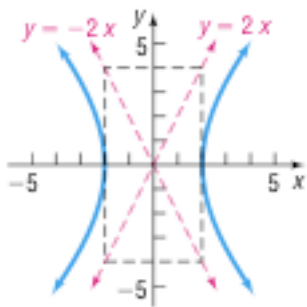
Opens up, vertex at $(1, -1)$ containing the point $(3, 5)$.



7. Find an equation for the ellipse with the major axis parallel to the ~~X~~-axis with a length of 3 units and the length of the minor axis is 2 units and the center is at $(-2, -1)$.



8. Find the equation of the following conic section in standard form:



9. Determine whether the graph of the equation is an ellipse, hyperbola, circle or parabola.

- $x^2 + y^2 + x + y = 0$
- $8x^2 - 4y^2 = 4$
- $3x^2 + 8x - y = 72$
- $8x^2 + 17y^2 = 20$
- $5x^2 + 5y^2 - 12y = 2$

10. Write the augmented matrix for the system.

$$\begin{cases} 5x + 6y = 94 \\ -2y = -18 \end{cases}$$

11. Perform the row operations on the given augmented matrix. Write your answer as a single final matrix.

(a) $R_2 = -4r_1 + r_2$

(b) $R_3 = 2r_1 + r_3$

$$\left[\begin{array}{ccc|c} 1 & -3 & -5 & 2 \\ 4 & -5 & 2 & 5 \\ -2 & -5 & 4 & 6 \end{array} \right]$$

12. Solve the system using matrices row operations.

$$x + y + z = -4$$

$$x - y + 5z = -24$$

$$2x + y + z = -6$$

13. Find the values of a, b, and c such that the graph of the quadratic equation $y = ax^2 + bx + c$ passes through the points $(-3, 0)$, $(1, -4)$, and $(2, -15)$

14. Solve the following systems.

a.
$$\begin{cases} 2x^2 + y^2 = 16 \\ 2x^2 - y^2 = 0 \end{cases}$$

b.
$$\begin{cases} x + y = 2 \\ xy = 1 \end{cases}$$

Key-

① $(y+2)^2 = 8(x+2)$

Opens: Right

Vertex: $(-2, -2)$

AOS: $y = -2$

X-Int: $y = 0$

$(0+2)^2 = 8(x+2)$

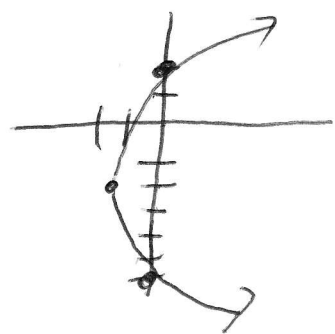
$4 = 8(x+2)$

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

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

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

$(-\frac{3}{2}, 0)$



y-Int: $x = 0$

$(y+2)^2 = 8(0+2)$

$(y+2)^2 = 16$

$y+2 = \pm 4$

$y = -2 \pm 4$

$y = -6 \quad y = 2$

$(0, -6)$

$(0, 2)$

② $(x+2)^2 = -5(y-1)$

Opens: down

Vertex: $(-2, 1)$

AOS: $x = -2$

X-Int: $y = 0$

$(x+2)^2 = -5(0-1)$

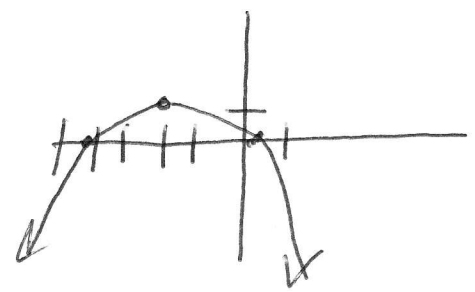
$(x+2)^2 = 5$

$x+2 = \pm\sqrt{5}$

$x = -2 \pm\sqrt{5}$

$(-2 \pm\sqrt{5}, 0)$

$(-0.24, 0) (-4.24, 0)$



y-Int: $x = 0$

$(0+2)^2 = -5(y-1)$

$4 = -5y + 5$

$-1 = -5y$

$\frac{1}{5} = y$

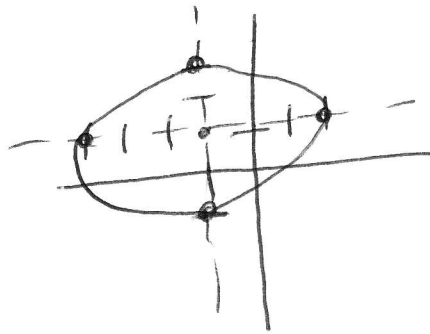
$(0, \frac{1}{5})$

③ ellipse

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

C: (-1, 1)

a=3 b=2

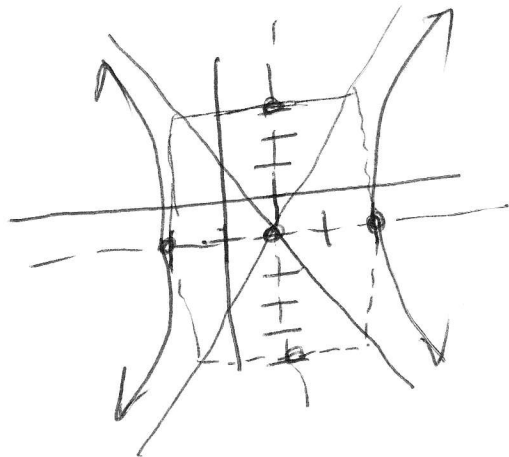


④ Hyperbola
x-first

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

C = (1, -1)

a=2 b=4



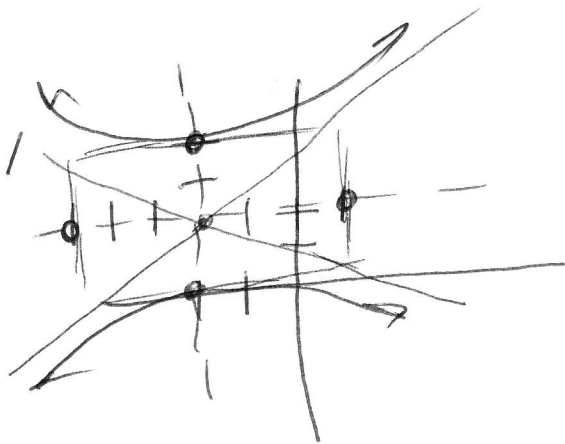
⑤ hyperbola

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

C: (-2, 2)

a=2 b=3

y first



⑥ Vertex (1, -1) point (3, 5)

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

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

$$5 = a(3-1)^2 - 1$$

$$5 = 4a - 1$$

$$b = 4a \Rightarrow a = \frac{6}{4} = \frac{3}{2}$$

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

②

3

7) C: (-2, -1) point

a = 3 b = 2

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

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

8) 4 units on y
2 units on x
C: (0, 0)

cuts x-axis so
x is first

$$\frac{x^2}{2^2} - \frac{y^2}{4^2} = 1$$

$$\frac{x^2}{4} - \frac{y^2}{16} = 1$$

9a) $x^2 + y^2 \in$ circle

b) $8x^2 - 4y^2 \in$ hyperbola

c) only square is $3x^2$ so parabola

d) $8x^2 + 17y^2 = 20 \in$ ellipse

e) $5x^2 + 5y^2 \in$ Circle

(10) $\begin{bmatrix} 5 & 6 & | & 94 \\ 0 & -2 & | & -18 \end{bmatrix}$

(11) $\begin{bmatrix} 1 & -3 & -5 & | & 2 \\ 0 & 7 & 22 & | & 3 \\ 0 & -11 & -6 & | & 10 \end{bmatrix}$

(12) $x = -2$
 $y = 2$
 $z = -4$ *see page 5*

(13) $y = -2x^2 - 5x + 3$
 $0 = 9a - 3b + c$
 $-4 = a + b + c$
 $-15 = 4a + 2b + c$

(14) $2x^2 + y^2 = 16$
 $2x^2 - y^2 = 0$

 $4x^2 = 16$
 $x^2 = 4$
 $x = \pm 2$

addition method.
 $x = 2 \quad 2(2)^2 + y^2 = 16$
 $8 + y^2 = 16$
 $y^2 = 8$
 $y = \pm\sqrt{8} = \pm 2\sqrt{2}$
 $(2, \pm 2\sqrt{2})$

$x = -2$ same as above
 $(-2, \pm 2\sqrt{2})$

(15) $x + y = 2 \Rightarrow y = 2 - x$
 $xy = 1$
 $x(2 - x) = 1$
 $2x - x^2 = 1$
 $0 = x^2 - 2x + 1$
 $0 = (x - 1)(x - 1)$
 $x = 1$

$x = 1$
 $y = 1(1) = 1$
 $(1, 1)$

#12

5

$$\left[\begin{array}{ccc|c} 1 & 1 & 1 & -4 \\ 1 & -1 & 5 & -24 \\ 2 & 1 & 1 & -6 \end{array} \right]$$

$$-1r_1 + r_2 = R_2$$

$$\left[\begin{array}{ccc|c} -1 & -1 & -1 & 4 \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 1 & -1 & 5 & -24 \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 0 & -2 & 4 & -20 \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 1 & 1 & 1 & -4 \\ 0 & -2 & 4 & -20 \\ 0 & -1 & -1 & 2 \end{array} \right]$$

$$-2r_1 + r_3 = R_3$$

$$\left[\begin{array}{ccc|c} -2 & -2 & -2 & 8 \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 2 & 1 & 1 & -6 \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 0 & -1 & -1 & 2 \end{array} \right]$$

$$\left[\begin{array}{ccc|c} 1 & 1 & 1 & -4 \\ 0 & 1 & -2 & 10 \\ 0 & -1 & -1 & 2 \end{array} \right]$$

$$-\frac{1}{2} * r_2$$

$$r_2 + r_3 = R_3$$

$$\left[\begin{array}{ccc|c} 1 & 1 & 1 & -4 \\ 0 & 1 & -2 & 10 \\ 0 & 0 & -3 & 12 \end{array} \right]$$

$$x + y + z = -4$$

$$y - 2z = 10$$

$$-3z = 12$$

$$z = -4$$

$$y - 2(-4) = 10$$

$$y + 8 = 10$$

$$y = 2$$

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

$$x - 2 = -4$$

$$x = -2$$

$$\begin{matrix} x & y & z \\ (-2, & 2, & -4) \end{matrix}$$