

What is the shape of the graph indicated by the equation?

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

Possible Answers:

Parabola

Ellipse

Hyperbola

Circle



**Correct answer:**

Ellipse

**Explanation:**

An ellipse has an equation that can be written in the format  $\frac{(x - h)^2}{b^2} + \frac{(y - k)^2}{a^2} = 1$ . The center is indicated by  $(h, k)$ , or in this case  $(0, 0)$ .

What is the center and radius of the circle indicated by the equation?

$$(x - 2)^2 + y^2 = 36$$

Possible Answers:

$$(2, 0), r = 6$$

$$(2, 0), r = 36$$

$$(-2, 0), r = 6$$

$$(-2, 0), r = 36$$



Correct answer:

$$(2, 0), r = 6$$

**Explanation:**

A circle is defined by an equation in the format  $(x - h)^2 + (y - k)^2 = r^2$ .

The center is indicated by the point  $(h, k)$  and the radius  $r$ .

In the equation  $(x - 2)^2 + (y)^2 = 36 = 6^2$ , the center is  $(2, 0)$  and the radius is  $6$ .

What is the minimal value of

$$2x^2 + 16x - 7$$

over all real numbers?

Possible Answers:

0

-10

-39

2

No minimum value.



Correct answer:

-39

Find the vertex  $(x, y)$  for a parabola with equation

$$y = 3x^2 - 6x + 1$$

Possible Answers:

$(1, -2)$

$(1, 3)$

$(1, 1)$

$(1, 2)$

$(2, -1)$



Correct answer:

$(1, -2)$

**Explanation:**

For any parabola of the form  $ax^2 + bx + c$ , the  $x$ -coordinate of its vertex is

$$x = \frac{-b}{2a}$$

Find the endpoints of the major and minor axes of the ellipse described by the following equation:

$$\frac{(x - 8)^2}{4} + \frac{(y + 2)^2}{25} = 1$$

Possible Answers:

*Major* : (8, -3), (8, 7)

*Minor* : (-6, -2)(-10, -2)

*Major* : (-3, -8), (7, -8)

*Minor* : (-2, 6)(-2, 10)

*Major* : (6, -2)(10, -2)

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**Correct answer:**

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The equation of an ellipse,  $E$ , is  $\frac{(x+3)^2}{9} + \frac{(y-7)^2}{36} = 1$ . Which of the following are the correct end points of the MAJOR axis of this ellipse?

Possible Answers:

$(0, -7)$  and  $(6, -7)$

$(3, 6)$  and  $(-3, -6)$

$(0, 7)$  and  $(-6, 7)$

$(3, -13)$  and  $(3, -1)$

$(-3, 13)$  and  $(-3, 1)$



Correct answer:

$(-3, 13)$  and  $(-3, 1)$

Find the endpoints of the major axis for the ellipse with the following equation:

$$\frac{x^2}{64} + \frac{y^2}{49} = 1$$

Possible Answers:

(0, 0)(0, 8)

(8, 0)(-8, 0)

(0, 8)(0, -8)

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Correct answer:

(8, 0)(-8, 0)

Find the endpoints of the major axis for the ellipse with the following equation:

$$\frac{x^2}{100} + \frac{y^2}{400} = 1$$

Possible Answers:

(10, 0)(-10, 0)

(0, 20)(0, -20)

(10, 0)(20, 0)

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Correct answer:

(0, 20)(0, -20)



Find the endpoints of the major axis of the ellipse with the following equation:

$$\frac{(x - 2)^2}{225} + \frac{(y + 11)^2}{256} = 1$$

Possible Answers:

$(2, -27)(2, 5)$

$(-27, 2)(5, 2)$

$(17, 2)(-11, 13)$

$(17, -11)(-13, -11)$



Correct answer:

$(2, -27)(2, 5)$

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Correct answer:

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What is the equation of the ellipse centered at the origin and passing through the point (5, 0) with major radius 5 and minor radius 3?

Possible Answers:

$$\frac{x^2}{3} + \frac{y^2}{5} = 1$$

$$\frac{x^2}{5} + \frac{y^2}{3} = 1$$

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$$\frac{x^2}{100} + \frac{y^2}{169} = 1$$

Possible Answers:

(13, 10)(-13, 10)

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(5, 7)(5, -5)

(1, 0)(10, 1)



Correct answer:

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Find the endpoints of the minor axis of the ellipse with the following equation:

$$25x^2 + 20y^2 + 200x - 120y + 80 = 0$$

Possible Answers:

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Correct answer:

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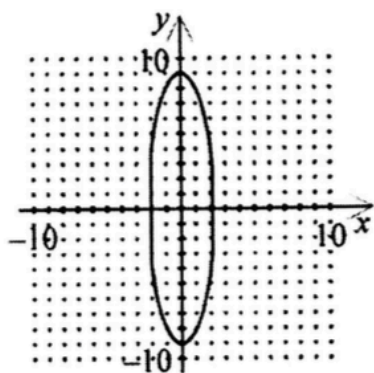
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53. Graph the equation. Identify the conic section. Then find the domain and range.

$$5x^2 + 5y^2 = 45$$

[A]

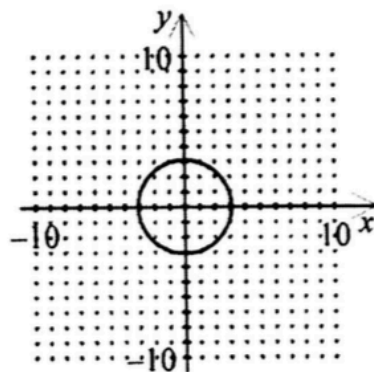


ellipse

$$\text{domain: } \{x \mid -\sqrt{5} \leq x \leq \sqrt{5}\}$$

$$\text{range: } \{y \mid -9 \leq y \leq 9\}$$

[B]

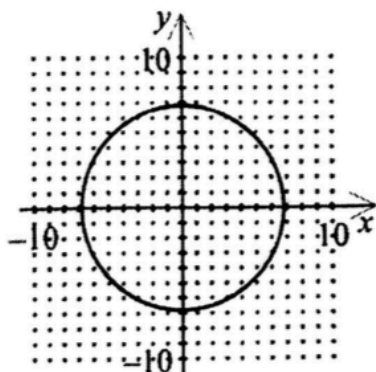


circle

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[C]

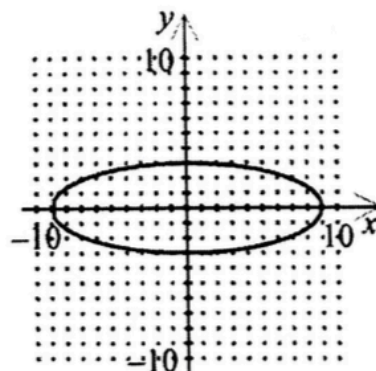


circle

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[D]

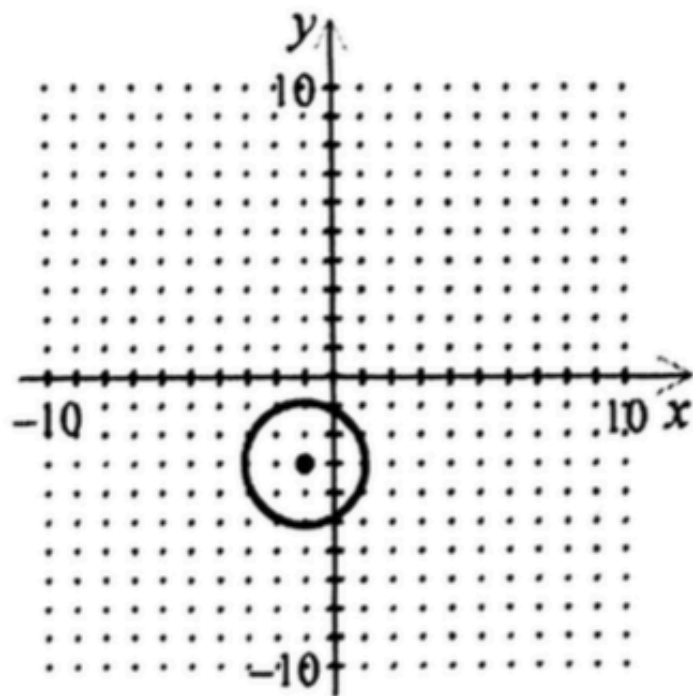


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$$\text{domain: } \{x \mid -9 \leq x \leq 9\}$$

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58. Find the foci for the equation of an ellipse. Then graph the ellipse.

$$\frac{x^2}{64} + \frac{y^2}{81} = 1$$

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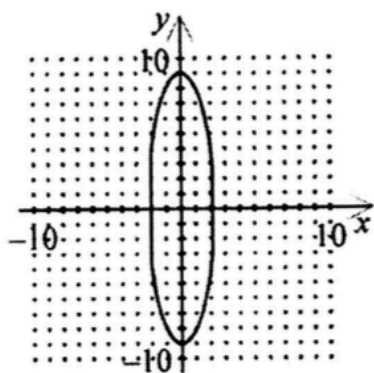
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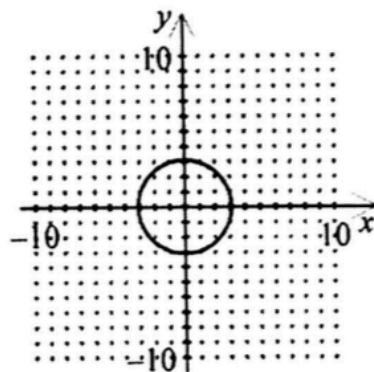


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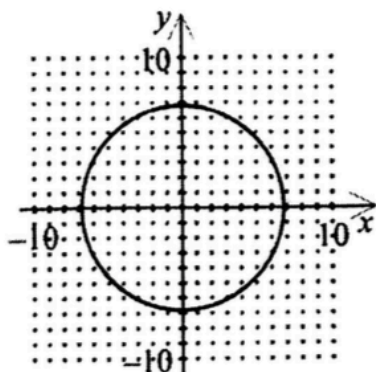


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[C]

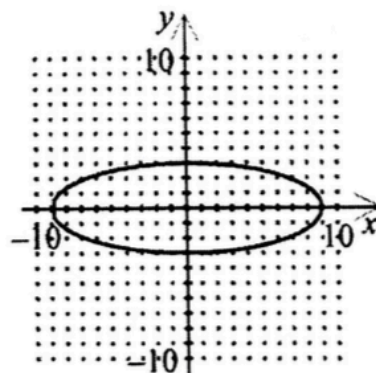


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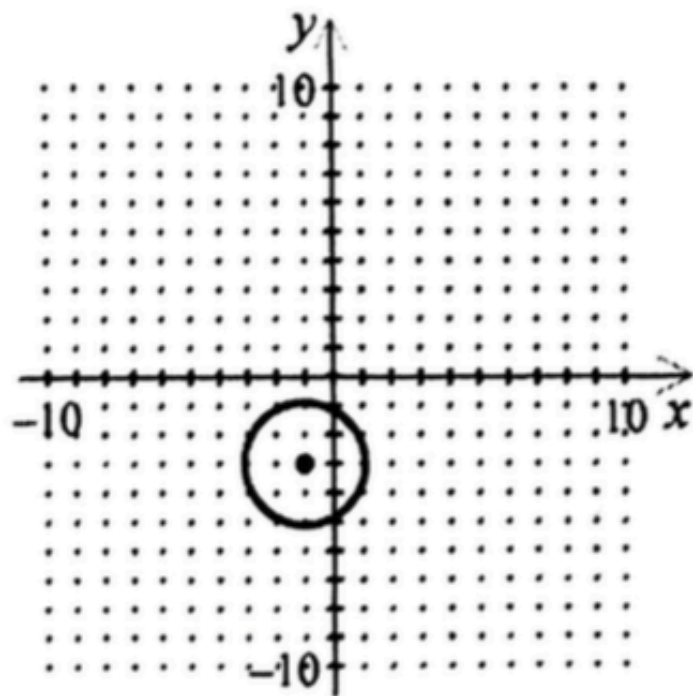


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$$\frac{x^2}{3} + \frac{y^2}{5} = 1$$

$$\frac{x^2}{5} + \frac{y^2}{3} = 1$$

$$\frac{x^2}{9} + \frac{y^2}{25} = 1$$

$$\frac{x^2}{25} - \frac{y^2}{9} = 1$$

$$\frac{x^2}{25} + \frac{y^2}{9} = 1$$



Correct answer:

$$\frac{x^2}{25} + \frac{y^2}{9} = 1$$



Find the endpoints of the minor axis of the ellipse with the following equation:

$$\frac{x^2}{100} + \frac{y^2}{169} = 1$$

Possible Answers:

(13, 10)(-13, 10)

(0, 13)(0, -13)

(10, 0)(-10, 0)

(0, 10)(0, -10)



Correct answer:

(10, 0)(-10, 0)

Find the endpoints of the minor axis of the ellipse with the following equation:

$$\frac{(x - 5)^2}{25} + \frac{(y - 1)^2}{36} = 1$$

Possible Answers:

(0, 1)(10, 1)

(1, 5)(10, 5)

(5, 7)(5, -5)

(1, 0)(10, 1)



Correct answer:

(0, 1)(10, 1)

Find the endpoints of the minor axis of the ellipse with the following equation:

$$25x^2 + 20y^2 + 200x - 120y + 80 = 0$$

Possible Answers:

$$(-4, 8)(-4, -2)$$

$$(-4 + 2\sqrt{5}, 3)(-4 - 2\sqrt{5}, 3)$$

$$(-4, 8)(-4, 2\sqrt{5})$$

$$(3, -4 + 2\sqrt{5})(3, -4 - 2\sqrt{5})$$



Correct answer:

$$(-4 + 2\sqrt{5}, 3)(-4 - 2\sqrt{5}, 3)$$

Find the endpoints of the minor axis of the ellipse with the following equation:

$$25x^2 + 64y^2 - 50x - 384y - 999 = 0$$

Possible Answers:

(8, 1)(-2, 1)

(9, 3)(1, 3)

(9, 3)(-8, 3)

(1, 8)(1, -2)



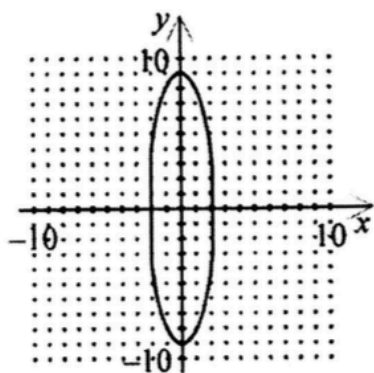
Correct answer:

(1, 8)(1, -2)

53. Graph the equation. Identify the conic section. Then find the domain and range.

$$5x^2 + 5y^2 = 45$$

[A]

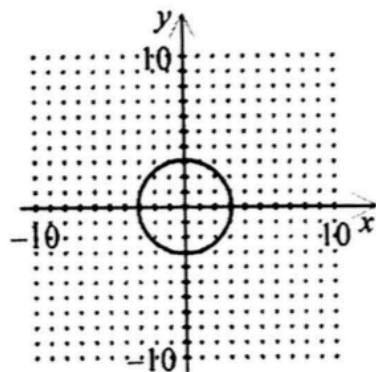


ellipse

$$\text{domain: } \{x \mid -\sqrt{5} \leq x \leq \sqrt{5}\}$$

$$\text{range: } \{y \mid -9 \leq y \leq 9\}$$

[B]

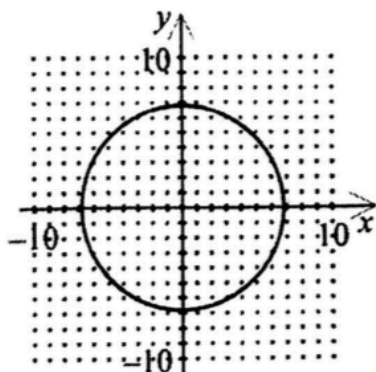


circle

$$\text{domain: } \{x \mid -3 \leq x \leq 3\}$$

$$\text{range: } \{y \mid -3 \leq y \leq 3\}$$

[C]

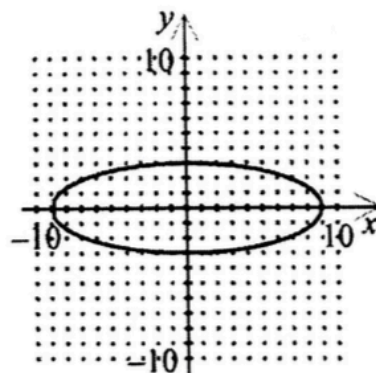


circle

$$\text{domain: } \{x \mid -\sqrt{45} \leq x \leq \sqrt{45}\}$$

$$\text{range: } \{y \mid -\sqrt{45} \leq y \leq \sqrt{45}\}$$

[D]

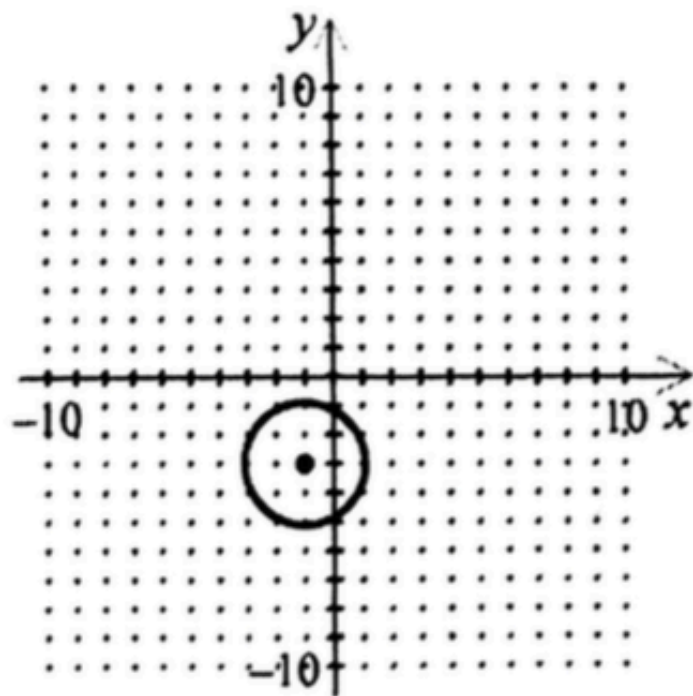


ellipse

$$\text{domain: } \{x \mid -9 \leq x \leq 9\}$$

$$\text{range: } \{y \mid -3 \leq y \leq 3\}$$

57. Write an equation in standard form for the circle.



58. Find the foci for the equation of an ellipse. Then graph the ellipse.

$$\frac{x^2}{64} + \frac{y^2}{81} = 1$$