Conic Sections Practice Test

1. Give the coordinates of the circle's center and it radius.

\[(x - 2)^2 + (y + 9)^2 = 1\]

2. Find the equation of the circle graphed below.

A) \(x^2 + y^2 = 4\)  
B) \(y^2 = x^2 + 16\)  
C) \(x^2 + y^2 = 16\)  
D) \(x^2 + y^2 = 1\)  
E) \(x^2 + y = 16\)
3. Graph the following equation.

\[ x^2 - 10x + y^2 = -9 \]

4. Find the vertex and focus of the parabola.

\[ (y - 2)^2 + 16(x - 3) = 0 \]

A) vertex: \((-3, -2)\) focus: \((-3, 14)\)
B) vertex: \((-3, -2)\) focus: \((-3, -18)\)
C) vertex: \((-3, -2)\) focus: \((-7, -2)\)
D) vertex: \((3, 2)\) focus: \((-1, 2)\)
5. Find the standard form of the equation of the parabola with the given characteristic and vertex at the origin.

focus: (0, 7)
A) \( x^2 = 28y \)  
B) \( x^2 = 7y \) 
C) \( x^2 = -7y \) 
D) \( y^2 = 28x \) 
E) \( y^2 = 7x \)

6. Find the standard form of the equation of the parabola with the given characteristic and vertex at the origin.

directrix: \( x = 1 \)
A) \( x^2 = -4y \)  
B) \( x^2 = 4y \) 
C) \( x^2 = y \) 
D) \( y^2 = x \) 
E) \( y^2 = -4x \)

7. Find the vertex and focus of the parabola.

\( y^2 = -\frac{9}{8}x \)

A) vertex: \( \left( 0, -\frac{5}{4} \right) \)  
B) vertex: \( (0, 0) \) 
C) vertex: \( (0, 0) \) 
D) vertex: \( (0, 0) \)

8. Find the equation of the parabola with vertex at \((5, 4)\) and focus at \((-3, 4)\).

A) \( (y - 4)^2 = -32(x - 5) \)  
B) \( (y - 4)^2 = 32(x - 5) \) 
C) \( (y + 4)^2 = 32(x + 5) \) 
D) \( (y + 4)^2 = -32(x - 5) \) 
E) \( (y - 4)^2 = 8(x - 5) \)

9. Find the equation of the parabola with vertex at \((0, 0)\) and focus at \((0, 5)\). Express the equation in standard form.
10. Find the center and vertices of the ellipse.

\( \frac{x^2}{49} + \frac{y^2}{4} = 1 \)

A) center: (7, 0) vertices: (0, -2), (0, 2)
B) center: (0, 0) vertices: (-2, 0), (2, 0)
C) center: (0, 0) vertices: (0, -7), (0, 7)
D) center: (0, 0) vertices: (-7, 0), (7, 0)

11. Find the center and foci of the ellipse.

\( \frac{(x+5)^2}{5} + \frac{(y+9)^2}{9} \)

A) center: (5, 9) foci: (5, 7), (5, 11)
B) center: (-5, -9) foci: (-5, -11), (-5, -7)
C) center: (-5, -9) foci: (-7, -9), (-3, -9)
D) center: (5, 9) foci: (3, -9), (7, -9)

12. Find the center and vertices of the ellipse.

\( 4x^2 + 9y^2 - 24x + 72y + 144 = 0 \)

A) center: (-4, 3) vertices: (-7, 3), (-1, 3)
B) center: (-3, 4) vertices: (-5, 4), (-1, 4)
C) center: (3, -4) vertices: (1, -4), (5, -4)
D) center: (3, -4) vertices: (0, -4), (6, -4)
E) center: (-3, 4) vertices: (-6, 4), (0, 4)
13. Identify the graph of the following ellipse.

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

A)  

B)  

C)  

14. Find the center and vertices of the hyperbola.

\[ 11x^2 - 25y^2 + 22x + 250y - 889 = 0 \]

A) center: (1, -5), vertices: (1, -10), (1, 0)
B) center: (-1, 5), vertices: (-1, 0), (-1, 10)
C) center: (-1, 5), vertices: (-6, 5), (4, 5)
D) center: (1, -5), vertices: (-4, -5), (6, -5)
15. Find the vertices and asymptotes of the hyperbola.

\[ 9y^2 - 16x^2 = 144 \]

A) vertices: \((0, \pm 4)\) asymptote: \(y = \pm \frac{4}{3}x\)

B) vertices: \((0, \pm 4)\) asymptote: \(y = \pm \frac{3}{4}x\)

C) vertices: \((\pm 4, 0)\) asymptote: \(y = \pm \frac{4}{3}x\)

D) vertices: \((\pm 4, 0)\) asymptote: \(y = \pm \frac{3}{4}x\)

16. Find the standard form of the equation of the hyperbola with the given characteristics.

vertices: \((0, \pm 6)\) foci: \((0, \pm 7)\)

A) \(\frac{y^2}{36} - \frac{x^2}{49} = 1\)

B) \(\frac{y^2}{36} - \frac{x^2}{13} = 1\)

C) \(\frac{x^2}{36} - \frac{y^2}{13} = 1\)

D) \(\frac{x^2}{36} - \frac{y^2}{13} = 49\)
17. Find the graph of the following ellipse.

\[ 9x^2 + 16y^2 - 36x - 64y + 44 = 0 \]

A) [Graph A]  
B) [Graph B]  
C) [Graph C]  
D) [Graph D]

18. Write the equation of the ellipse that has its center at the origin with focus at (0, 4) and vertex at (0, 7).

A) \[ \frac{x^2}{49} + \frac{y^2}{33} = 1 \]  
B) \[ \frac{x^2}{33} - \frac{y^2}{49} = 1 \]  
C) \[ \frac{x^2}{33} + \frac{y^2}{49} = -1 \]  
D) \[ \frac{x^2}{33} + \frac{y^2}{49} = 1 \]

19. Find the center and vertices of the ellipse.

\[ x^2 + 9y^2 + 16x - 54y + 136 = 0 \]

A) center: (3, –8)  vertices: (0, –8), (6, –8)  
B) center: (8, –3)  vertices: (7, –3), (9, –3)  
C) center: (–8, 3)  vertices: (–9, 3), (–7, 3)  
D) center: (–8, 3)  vertices: (–11, 3), (–5, 3)  
E) center: (8, –3)  vertices: (5, –3), (11, –3)
20. Find the standard form of the equation of the ellipse with the following characteristics.

Foci: \((\pm 4, 0)\)  
Major axis of length: 12

\[
\begin{align*}
A) \quad & \frac{x^2}{36} + \frac{y^2}{20} = 1 \\
B) \quad & \frac{x^2}{36} + \frac{y^2}{16} = 1 \\
C) \quad & \frac{x^2}{16} + \frac{y^2}{36} = 1 \\
D) \quad & \frac{x^2}{144} + \frac{y^2}{16} = 1 \\
E) \quad & \frac{x^2}{144} + \frac{y^2}{128} = 1
\end{align*}
\]

21. Find the standard form of the equation of the hyperbola with the given characteristics.

Vertices: \((-2, -4), (-2, 6)\)  
Foci: \((-2, -5), (-2, 7)\)

\[
\begin{align*}
A) \quad & \frac{(y - 1)^2}{25} - \frac{(x + 2)^2}{11} = 1 \\
B) \quad & \frac{(y + 1)^2}{25} - \frac{(x - 2)^2}{11} = 1 \\
C) \quad & \frac{(y - 2)^2}{11} - \frac{(x + 1)^2}{25} = 1 \\
D) \quad & \frac{(y - 1)^2}{25} - \frac{(x + 2)^2}{36} = 1
\end{align*}
\]

22. Graph the hyperbola.

\[9x^2 - 9y^2 = 81\]
23. Identify the conic by writing the equation in standard form.

\[10y^2 - 20x^2 + 60y + 160x - 255 = 0\]

A) \(\frac{(y - 3)^2}{\frac{5}{2}} - \frac{(x - 4)^2}{\frac{5}{4}} = 1\); hyperbola

B) \(\frac{(y + 3)^2}{\frac{5}{2}} - \frac{(x - 4)^2}{\frac{5}{4}} = 1\); hyperbola

C) \(\frac{(y + 3)^2}{\frac{97}{2}} - \frac{(x - 4)^2}{\frac{97}{4}} = 1\); hyperbola

24. Identify the conic by writing the equation in standard form.

\[4x^2 + 4y^2 + 40x + 16y + 40 = 0\]

A) \((x + 5)^2 + (y + 2)^2 = 19\); circle

B) \((x + 5)^2 + (y + 2)^2 = 39\); circle

C) \(\frac{(x + 5)^2}{\frac{11}{4}} + \frac{(y + 2)^2}{\frac{11}{4}} = 1\); ellipse
Conic Sections Practice Test
Answer Section

1. \((2, -9), \ r = 1\)
2. C
3. B
4. D
5. A
6. E
7. D
8. A
9. \(x^2 = 20y\)
10. D
11. B
12. D
13. A
14. C
15. A
16. B
17. B
18. D
19. D
20. A
21. A
22. C
23. B
24. A