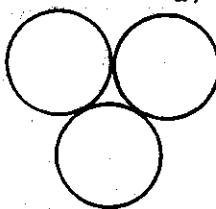


CONIC SECTIONS
TOPIC TEST

1. If (h,k) is the center of the circle given by $x^2+y^2+2x-4y-3=0$, then $h+k=$
 a) 3 b) 1 c) -1 d) -3 e) N.O.T.
2. Find the vertex of the parabola whose equation is $y=2x^2+4x-7$.
 a) $(-1,-1)$ b) $(-1,-6)$ c) $(-1,-9)$ d) $(-1,-11)$ e) N.O.T.
3. For the ellipse given by $\frac{x^2}{36} + \frac{y^2}{64} = 1$, the major axis has length=
 a) 12 b) 16 c) 72 d) 128 e) N.O.T.
4. Solve for k so that the graph of $y=x^2-6x+k$ is tangent to the x -axis.
 a) 3 b) 6 c) 9 d) 12 e) N.O.T.
5. Find the area of the circle given by $2x^2+2y^2-4x+8y-6=0$.
 a) 4π b) 5.5π c) 8π d) 16π e) N.O.T.
6. Find the area of the circle given by $r=6\sin\theta$.
 a) 3π b) 6π c) 9π d) 36π e) N.O.T.

7. Three circles of radius 4 are externally tangent to each other. A band is wrapped tightly around the outside of the circles. Find the length of the band.



- a) $8(3+\pi)$ b) $8(3+2\pi)$ c) $8(3+\frac{2}{3}\pi)$ d) $4(3+4\pi)$ e) N.O.T.
8. Which of the following is an asymptote line of the graph $\frac{y^2}{36} - \frac{x^2}{49} = 1$?
 a) $6x-7y=0$ b) $7x-6y=0$ c) $36x-49y=0$ d) $49x-36y=0$ e) N.O.T.
9. Which of the following are asymptote lines of the graph $\frac{(y-1)^2}{36} - \frac{(x-2)^2}{25} = 1$?
 I $5x-6y=4$ II $5x+6y=16$ III $6x-5y=7$ IV $6x+5y=17$
 a) I only b) IV only c) I and II d) III and IV e) N.O.T.

10. Which of the following equations names an ellipse with major axis of length 6, center at (0,0) and one focus at (2,0)?

- a) $5x^2+9y^2=45$ b) $x^2+3y^2=3$ c) $4x^2+9y^2=36$ d) $8x^2+9y^2=288$ e) N.O.T.

11. The ellipse whose equation is $x^2+4y^2=4$ is inscribed in a rectangle which is inscribed in an ellipse which contains the point (4,0). Write an equation of the larger ellipse.

- a) $4x^2+y^2=64$ b) $x^2+16y^2=16$ c) $3x^2+64y^2=48$ d) $x^2+12y^2=16$ e) N.O.T.

12. Write an equation of the hyperbola with y-intercepts (0,± 6) and one focus at (0,7).

- a) $\frac{y^2}{36} - \frac{x^2}{49} = 1$ b) $\frac{y^2}{36} - \frac{x^2}{13} = 1$ c) $\frac{y^2}{13} - \frac{x^2}{36} = 1$ d) $\frac{y^2}{49} - \frac{x^2}{36} = 1$ e) N.O.T.

13. Write an equation of the circle with center (-3,-1) tangent to $3x+4y=3$.

- a) $5x^2+5y^2+30x+10y+34=0$ c) $4x^2+4y^2+24x+8y-45=0$ e) N.O.T.
b) $x^2+y^2+6x+2y+6=0$ d) $25x^2+25y^2+150x+50y-6=0$

14. Write an equation of the locus of points such that the distance from the point (2,3) is two-thirds the distance from the point (3,2).

- a) $5x^2+5y^2-12x-38y+65=0$ c) $x^2+y^2-10x+13=0$ e) N.O.T.
b) $5x^2+5y^2-38x-12y+65=0$ d) $x^2+y^2-10y+13=0$

15. A circle is circumscribed about a triangle whose vertices are (1,1), (2,-1) and (3,0). Find the area of the region inside the circle and outside the triangle.

- a) $\frac{25\pi-27}{18}$ b) $\frac{25\pi-45}{18}$ c) $\frac{25\pi-9}{18}$ d) $\frac{413\pi-54}{36}$ e) N.O.T.

16. Find an equation of a parabola whose latus rectum has endpoints (0,4) and (4,4).

- a) $4x^2-16x-y+19=0$ c) $x^2-4x-4y+12=0$ e) N.O.T.
b) $x^2-4x-4y+16=0$ d) $x^2-4x-4y+7=0$

17. Name the shape of the graph whose equation is $x^2+y^2-4x-6y+13=0$.

- a) circle b) ellipse c) hyperbola d) parabola e) N.O.T.

18. Consider the graph of the equation $\frac{(x-2)^2}{4} + \frac{(y-4)^2}{16} = 1$.

WHICH OF THE FOLLOWING STATEMENT ARE FALSE?

- I The graph is tangent to both axes
- II The point (4,4) is an endpoint of the major axis
- III The point (2,4) is the center
- IV The length of the major axis is 8

a) I only b) II and III c) I,II and III d) all e) N.O.T.

19. Given the hyperbola whose equation is $9x^2 - 4y^2 = 36$, consider the following statements. WHICH STATEMENTS ARE TRUE?

- I The line $3x - 2y = 0$ is an asymptote
- II The point $(-\sqrt{13}, 0)$ is a focus
- III The point (x, y) which lies 2 units from one focus lies 10 units away from the other focus
- IV The point $(0, 3)$ lies on the conjugate axis

a) I, III and IV b) I, II and IV c) I, II and III d) all e) N.O.T.

20. Which of the following is defined as "as locus of points such that the distances from a point and a fixed line are equal"?

a) circle b) ellipse c) hyperbola d) parabola e) N.O.T.

21. Consider the graph of the equation $2y^2 - 8y - x + 5 = 0$. WHICH OF THE FOLLOWING STATEMENTS ARE TRUE?

- I The graph opens to the right
- II The line $x = -(25/8)$ is the directrix
- III The length of the latus rectum is .5
- IV The point $(5, 0)$ is the only x-intercept

a) I and IV b) I, II and IV c) I, III and IV d) all e) N.O.T.

22. Identify the shape of the graph given by $2x^2 + 3xy + y^2 - 2x + y - 3 = 0$.

a) circle b) ellipse c) hyperbola d) parabola e) N.O.T.

23. Identify the shape of the graph given by $r = \frac{3}{2 - 3\cos\theta}$

a) circle b) ellipse c) hyperbola d) parabola e) N.O.T.

24. In the elliptical orbit of a certain planet the sun is a focal point. Find the eccentricity of the planet's orbit if the ratio of its greatest distance from the sun to its least distance from the sun is 24:19.

a) $\frac{1}{43}$ b) $\frac{5}{48}$ c) $\frac{5}{43}$ d) $\frac{19}{43}$ e) N.O.T.

25. Which point is one focus of the hyperbola given by $16y^2 - 9x^2 = 144$?

a) $(-\sqrt{7}, 0)$ b) $(-5, 0)$ c) $(0, -\sqrt{7})$ d) $(0, -5)$ e) N.O.T.

26. An arch in the shape of a semi-circle is five feet high one foot in from the side. Find the maximum height of the arch (in feet).

- a) 12 b) 13 c) 24 d) 26 e) N.O.T.

27. A tunnel in the shape of a semi-ellipse is sixty feet wide and twelve yards high in the center. Find its height (in feet) six feet from the edge.

- a) 7.2 b) $\frac{72-\sqrt{6}}{5}$ c) $\frac{6-\sqrt{781}}{5}$ d) 21.6 e) N.O.T.

28. In how many points do the graphs of the equations $x^2+4y^2=4$ and $y=x^2-1$ intersect when graphed on a cartesian plane?

- a) 0 b) 1 c) 2 d) 3 e) N.O.T.

29. Which of the points below is one focus of the conic section given by the equation $5x^2-6xy+5y^2=8$?

- a) $(\sqrt{3}, 0)$ b) $(\sqrt{3}, \sqrt{3})$ c) $(\frac{\sqrt{6}}{2}, 0)$ d) $(\frac{\sqrt{6}}{2}, \frac{\sqrt{6}}{2})$ e) N.O.T.

30. The circles given by $x^2+y^2-2x-2y-4=0$ & $x^2+y^2-8x-8y+26=0$ overlap. Find the area of the region contained in both circles.

- a) $2\pi - 3\sqrt{3}$ b) $4\pi - 3\sqrt{3}$ c) $2\pi - 2\sqrt{3}$ d) $4\pi - 2\sqrt{3}$ e) N.O.T.