Twelfth Grade - Conics

1) Find the equation of the following parabola with indicated focus and directrix.
(a, 0) ; x = ? a, a > 0

- $x^2 = 4ay$
- $y^2 = -4ax$
- $x^2 =- 4ay$
- $y^2 = 4ax$

2) Find the equation of the parabola if the vertex is (0, 0) and the focus is (?a, 0), a > 0

- $x^2 = -4ay$
- $y^2 = 4ax$
- $x^2 = 4ay$
- $y^2 = -4ax$

3) Find the equation of the parabola if the vertex is (4, 1) and the focus is (4, ?3)

- $(x ? 4)^2 = ? 16 (y + 1)$
- $(x ? 4)^2 = ?16 (y ? 1)$
- $(x ? 4)^2 = ?10 (y ? 1)$
- $(x ? 4)^2 = 6 (y ? 1)$

4) Find the equation of the parabola whose vertex is (1, 2) and the equation of the latus rectum is x = 3

- $(y ? 2)^2 = 8 (x ? 1)$
- $(y ? 2)^2 = 9 (x ? 1)$
- $(y ? 2)^2 = 13 (x ? 1)$
- $(y ? 2)^2 = 7 (x + 1)$

5) Find the equation of the parabola if the curve is open rightward, vertex is (2, 1) and passing through point (6, 5)

- $(y ? 1)^2= 4(x ? 2)$
- $(y ? 1)^2 = 5(x ? 2)$
- $(y ? 1)^2 = 14(x ? 2)$
- $(y ? 1)^2 = -4(x ? 2)$

6) Find the equation of the parabola if the curve is open upward, vertex is (?1, ?2) and the length of the latus rectum is 4

- $(x + 1)^2 = 12 (y + 2)$
- $(x + 1)^2 = 4 (y + 2)$
- $(x + 1)^2 = 8 (y + 2)$
- $(x + 1)^2 = 6 (y - 2)$

7) Find the directrix for the parabola $y^2 = 4x$

- -1
- 0
- 4
- 1

8) Find the length of Latus Rectum for the parabola $y^2 = 4x$

- -1
- 1
- 0
- 4

9) Find the axis for the parabola $x^2 = ? 4y$

- x = -1

- x = 0
- x = 2
- x = 1

10) Find the directrix for the parabola $(y + 2)^2 = ? 8(x + 1)$

- -3
- 5
- 6
- 2

11) Find the vertex for the parabola $y^2 ? 8x + 6y + 9 = 0$

- (0, 3)
- (0, ?3)
- (3, 0)
- (3, ?3)

12) Find the focus for the parabola $y^2 ? 8x + 6y + 9 = 0$

- (3, -2)
- (?3, ?2)
- (?3, 2)
- (3, 2)

13) Find the directrix for the parabola $(y + 2)^2 = ? 8(x + 1)$

- -2
- 3
- 4
- -3

14) Find the length of the lactus rectum for the parabola y^2 ? 8x + 6y + 9 = 0

- 8
- 3
- -3
- -8

15) Find the focus for the parabola x^2 ? 2x + 8y + 17 = 0

- (1, ?4)
- (-1, ? 4)
- (-1, 4)
- (1, 4)

16) Find the directrix for the parabola x^2 ? 2x + 8y + 17 = 0

- x = 1
- y = 0
- y = 1
- x = 0

17) Find the axis for the parabola x^2 ? 2x + 8y + 17 = 0

- x = 1
- y = 0
- x = 0
- y = 1

18) The girder of a railway bridge is in the parabolic form with span100 ft. and the highest point on the arch is 10 ft. above the bridge. Find the height of the bridge at 10 ft. to the left or right from the midpoint of the bridge.

- 49/5

- 47/5
- 39/5
- 48/5

19) The headlight of a motor vehicle is a parabolic reflector of diameter 12cm and depth 4cm. Find the position of bulb on the axis of the reflector for effective functioning of the headlight.

- 2.25
- 2.2
- 2.5
- 2.0

20) On lighting a rocket cracker, it gets projected in a parabolic path and reaches a maximum height of 4mts when it is 6 mts away from the point of projection. Finally, it reaches the ground 12 mts away from the starting point. Find the angle of projection.

- tan?¹(1)
- tan?¹(1/3)
- tan?¹(2/3)
- tan?¹(4/3)

21) A reflecting telescope has a parabolic mirror for which the distance from the vertex to the focus is 9mts. If the distance across (diameter) the top of the mirror is 160cm, how deep is the mirror at the middle?

- 13/9
- 12/9
- 11/9
- 16/9

22) Assume that water issuing from the end of a horizontal pipe, 7.5m above the ground, describes a parabolic path. The vertex of the parabolic path is at the end of the pipe. At a position 2.5m below the line of the pipe, the flow of water has curved outward 3m beyond the vertical line through the end of the pipe. How far beyond this vertical line will the water strike the ground?

- ?3
- 5?3
- 3?3
- 4?3

23) Find the equation of the standard rectangular hyperbola whose center is (?2/3, 2) and which passes through the point (1, ?2/3)

- 2xy + 6x + 9y + 2 = 0
- 2xy - 3x + 8y + 1 = 0
- 2xy + 3x + 4y + 1 = 0
- 2xy + 7x + 6y + 9 = 0

24) A comet is moving in a parabolic orbit around the sun which is at the focus of a parabola. When the comet is 80 million kms from the sun, the line segment from the sun to the comet makes an angle of ?/3 radians with the axis of the orbit. find how close does the comet come nearer to the sun?

- 20
- 15
- 76
- 56

25) A cable of a suspension bridge hangs in the form of a parabola when the load is uniformly distributed horizontally. The distance between two towers is 1500 ft, the points of support of the cable on the towers are 200ft above the road way and the lowest point on the cable is 70ft above the roadway. Find the vertical distance to the cable (parallel to the roadway) from a pole whose height is 122 ft.

- 350?10
- 450?10
- 150?10
- 300?10

26) Find the equation of the ellipse whose one of the foci is (2, 0) and the corresponding directrix is x = 8 and eccentricity is 1/2

- $-x^2/16 - y^2/12 = 1$
- $x^2/16 + y^2/12 = 1$
- $-x^2/16 + y^2/12 = 1$
- $x^2/16 - y^2/12 = 1$

27) Find the equation of the ellipse with focus (?1, ?3), directrix x ? 2y = 0 and eccentricity 4/5

- $520x^2 + 64xy + 56y^2 + 850x + 750y + 598 = 0$
- $109x^2 - 64xy - 61y^2 + 250x - 750y + 1250 = 0$
- $109x^2 - 64xy + 61y^2 -250x + 750y - 1250 = 0$
- $109x^2 + 64xy + 61y^2 + 250x + 750y + 1250 = 0$

28) Find the equation of the ellipse with foci (±4, 0) and vertices (±5, 0)

- $-x^2/25 + y^2/9 = 1$
- $-x^2/25 - y^2/9 = 1$
- $x^2/25 - y^2/9 = 1$
- $x^2/25 + y^2/9 = 1$

29) The center of the ellipse is (2, 3). One of the foci is (3, 3). Find the other focus.

- (-1, 3)
- (0, 3)
- (1, 3)
- (3, 1)

30) Find the equation of the ellipse whose center is (1, 2), one of the foci is (1, 3) and eccentricity is 1/2

- $(x ? 1)^2/3 + (y ? 2)^2/4 = 1$
- $(x ? 3)^2/3 + (y ? 5)^2/4 = 1$

- $(x ? 3)^2/3 + (y ? 4)^2/4 = 1$
- $(x ? 2)^2/3 + (y ? 5)^2/4 = 1$