

Determine whether each of the following is a parabola, hyperbola, ellipse, circle or none.

1. $y^2 + 2x^2 - 3 = 0$

4. $2y^2 + 2x^2 - 3 = 0$

2. $y + 2x^2 - 3 = 0$

5. $y^2 - 2x^2 - 3 = 0$

3. $y + 2x - 3 = 0$

Write the equation of each in standard form and determine which type of conic section the equation represents.(ellipse, circle, or hyperbola)

6. $y^2 + x^2 + 2x - 3 = 0$

7. $y^2 + 4y + 2x^2 - 4x = -2$

8. $4y^2 + 32y - x^2 - 16x - 16 = 0$

9. Find the center and radius of $y^2 + x^2 - 2x - 3 = 0$.

Find the center, foci, and vertices of each of the following.

10. $\frac{(y-3)^2}{4} + \frac{(x+1)^2}{5} = 1$

12. $\frac{x^2}{100} + \frac{(y+1)^2}{144} = 1$

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

13. $(x+6)^2 - \frac{(y-1)^2}{9} = 1$

Sketch/Graph each of the following. For each, state the coordinates of the center, foci, and vertices. In addition, for hyperbolas include the equations of the asymptotes and state whether the transverse axis is vertical or horizontal.

14. $4y^2 + 32y - x^2 - 16x - 16 = 0$

16. $x^2 - \frac{(y-1)^2}{9} = 1$

15. $y^2 + 4y + 2x^2 - 4x = -2$

17. $\frac{(y-3)^2}{4} + \frac{(x+1)^2}{9} = 1$

18. Write the equation of the circle whose diameter has the endpoints (-1,4) and (3, - 4).

For 19 - 24, solve for θ in the interval $0^\circ \leq \theta \leq 360^\circ$. When necessary round θ to the nearest tenth of a degree.

19. $3\cos^2 \theta - 5\cos \theta - 4 = 0$

20. $3\csc^2 \theta - 4 = 0$

21. $2\cos^2 \theta = \cos \theta$

22. $2\sin^2 \theta - \sin \theta - 1 = 0$

23. $2\cos^2 \theta - 7\cos \theta + 3 = 0$

24. $\sec^2 \theta - 1 = 1$

25. Find the exact value of $\sin(75^\circ)$.

26. If $\sin A = \frac{3}{5}$ and A is in Quadrant I, $\cos B = -\frac{5}{13}$ and B is in Quadrant II, find $\cos(A + B)$.

27. If $\sin A = \frac{3}{5}$, $\cos B = \frac{5}{13}$, and A and B are measures of angles in Quadrant I, find $\tan(A + B)$.

28. If $\sin A = \frac{4}{5}$ and A is in Quadrant I, $\cos B = \frac{8}{17}$ and B is in Quadrant IV, find $\sin(A - B)$.

29. Verify that $\cos(\pi + x) = -\cos x$.

30. If $\cos A = \frac{5}{13}$ and A is in Quadrant I, find each of the following:

(a) $\sin 2A$

(b) $\tan 2A$

31. If $\sin A = -0.8$, what is the value of $\cos 2A$?

32. If $\cos A = -0.6$, and A resides in Quadrant III, what is the value of $\cos 2A$?