

PRELIMINARIES

Find the distance between the following points. Give both an exact answer in simplest form and a decimal approximation rounded to the nearest hundredth.

1. $(1,5)$ & $(4,10)$
2. $(-2,3)$ & $(-5,-8)$
3. $(-5,7)$ & $(17,20)$

Find the equation in standard form for the circle with the given center and radius.

4. $(1,5)$ & $r = 3$
5. $(-2,3)$ & $r = 1$
6. $(17,20)$ & $r = 5$
7. $(0,0)$ & $r = 1$

Complete the square to write the equation for the circle in standard form. Identify the center and radius.

8. $x^2 + y^2 + 4x + 10y + 12 = 0$
9. $4x^2 + 4y^2 - 16x + 32y - 24 = 0$
10. $x^2 + y^2 + 41x - 107y - 43 = 0$
11. $2x^2 + 2y^2 - 15x + 97y + 13 = 0$

Complete the following tables using exact values.

12.

<i>degrees</i>	0	30	45	60	90
cosine					
sine					
tangent					
cotangent					
secant					
cosecant					

13.

<i>radians</i>	0	$\pi/6$	$\pi/4$	$\pi/3$	$\pi/2$
cosine					
sine					
tangent					
cotangent					
secant					
cosecant					

Use the identity $\cos^2 \theta + \sin^2 \theta = 1$ & $\cos(a + b) = \cos a \cos b - \sin a \sin b$ to help you verify the following identities.

14. $1 + \tan^2 \theta = \sec^2 \theta$

15. $\cot^2 \theta + 1 = \csc^2 \theta$

16. $\cos^2 \theta = \frac{1 + \cos 2\theta}{2}$

17. $\sin^2 \theta = \frac{1 - \cos 2\theta}{2}$

18. $\sin(a + b) = \cos\left[\frac{\pi}{2} - (a + b)\right]$

19. $\sin(a + b) = \sin a \cos b + \sin b \cos a$

Give formulas for the following.

20. Area of a circle

21. Circumference of a circle

22. Area of a parallelogram

23. Area of a trapezoid

24. Volume of a sphere

Find equations in slope-intercept form (if possible) for the following.

25. The line of slope 3 that passes through the point (1,5).

26. The line that passes through (-2,8) and (4,-5).

27. The line that passes through (-2,-10) and (2,-5).

28. The line that passes through (-2,-10) and (-2,-5).

29. The line that passes through (-2,-10) and (2,-10).

30. The line that passes through (-2,-10) and is perpendicular to $3x + 2y = 10$.

Find the following.

31. $\frac{d}{dx} \cos x$

32. $\frac{d}{dx} \sin x$

33. $\frac{d}{dx} \sec x$

34. $\frac{d}{dx} \csc x$

35. $\frac{d}{dx} \tan x$

36. $\frac{d}{dx} \cot x$

37. $\int \cos x dx$

38. $\int \sin x dx$

39. $\int \sec x dx$

40. $\int \csc x dx$

41. $\int \tan x dx$

42. $\int \cot x dx$

Perform the indicated operations.

$$43. \begin{pmatrix} 1 & 2 \\ 3 & 4 \end{pmatrix} \begin{pmatrix} 5 & 6 \\ 7 & 8 \end{pmatrix}$$

$$44. (1 \ 2 \ 3) \begin{pmatrix} 4 \\ 5 \\ 6 \end{pmatrix}$$

$$45. \begin{pmatrix} 2 & 3 \\ 4 & 5 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix}$$

$$46. \begin{vmatrix} 3 & 2 \\ 1 & 4 \end{vmatrix}$$

$$47. \begin{vmatrix} 2 & 4 & 6 \\ 3 & 0 & 1 \\ 1 & 4 & 5 \end{vmatrix}$$

$$48. \begin{vmatrix} 2 & 4 & 6 \\ 7 & 8 & 9 \\ 9 & 8 & 8 \end{vmatrix}$$

$$49. \begin{vmatrix} 7 & 8 & 9 \\ 2 & 4 & 6 \\ 9 & 8 & 8 \end{vmatrix}$$

$$50. \begin{vmatrix} 2 & 4 & 6 \\ 1 & 2 & 3 \\ 4 & 5 & 6 \end{vmatrix}$$