

6.4

SM3 Trigonometric Functions and Special Right Triangles

Name _____ Date _____ Period _____

Rationalize the denominator. Show your work. Leave answers exact and simplified.

1. $\frac{1}{\sqrt{3}}$

2. $\frac{\sqrt{2}}{\sqrt{3}}$

3. $\frac{1}{2\sqrt{5}}$

4. $-\frac{5}{\sqrt{2}}$

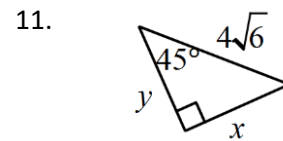
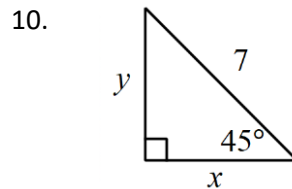
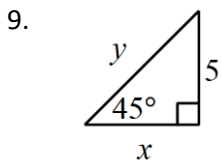
5. $\frac{2\sqrt{3}}{3\sqrt{2}}$

6. $\frac{1}{\sqrt{2}}$

7. $\frac{2}{\sqrt{2}}$

8. $-\frac{3}{4\sqrt{3}}$

Find the missing sides using special right triangle rules for $45^\circ - 45^\circ - 90^\circ$. Leave answer in simplest radical form.



$x =$ _____

$x =$ _____

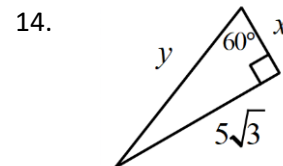
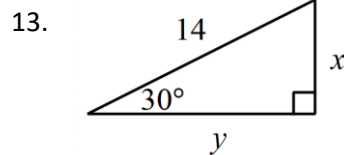
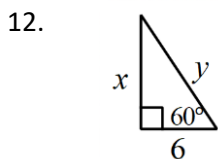
$x =$ _____

$y =$ _____

$y =$ _____

$y =$ _____

Find the missing sides using special right triangle rules for $30^\circ - 60^\circ - 90^\circ$. Leave answer in simplest radical form.



$x =$ _____

$x =$ _____

$x =$ _____

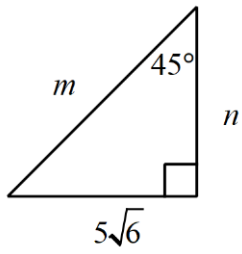
$y =$ _____

$y =$ _____

$y =$ _____

Find the missing sides using special right triangle rules ($30^\circ - 60^\circ - 90^\circ$ or $45^\circ - 45^\circ - 90^\circ$). Leave answer in simplest radical form.

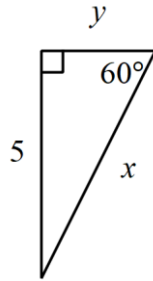
15.



$m =$ _____

$n =$ _____

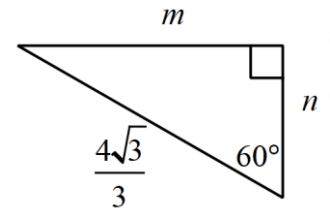
16.



$x =$ _____

$y =$ _____

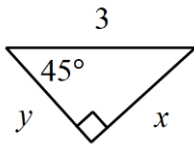
17.



$m =$ _____

$n =$ _____

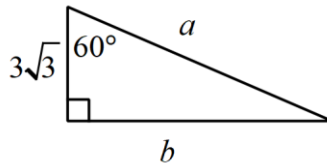
18.



$x =$ _____

$y =$ _____

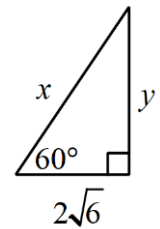
19.



$a =$ _____

$b =$ _____

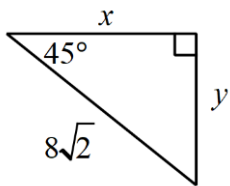
20.



$x =$ _____

$y =$ _____

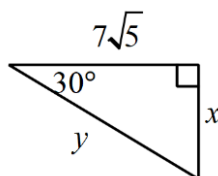
21.



$x =$ _____

$y =$ _____

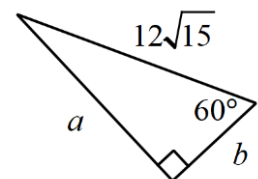
22.



$x =$ _____

$y =$ _____

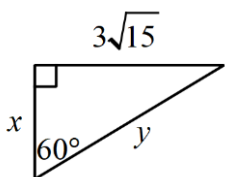
23.



$a =$ _____

$b =$ _____

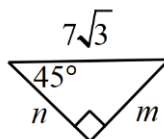
24.



$x =$ _____

$y =$ _____

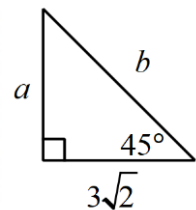
25.



$m =$ _____

$n =$ _____

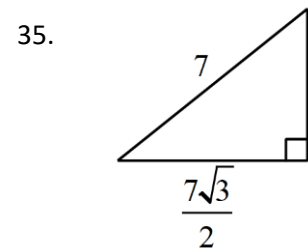
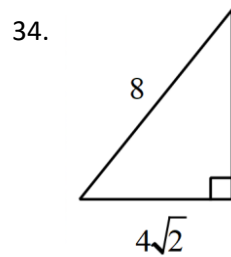
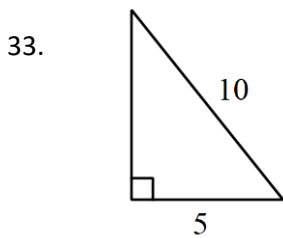
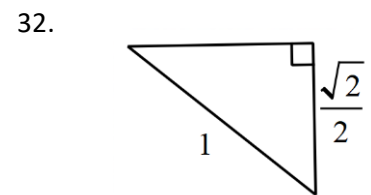
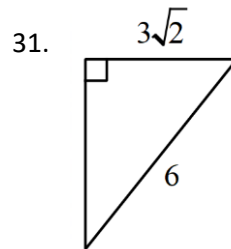
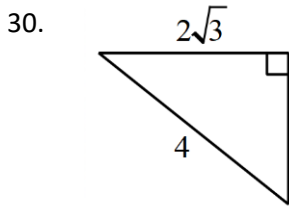
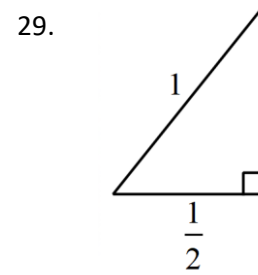
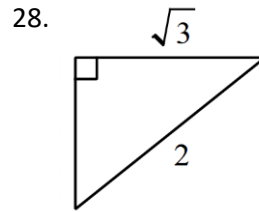
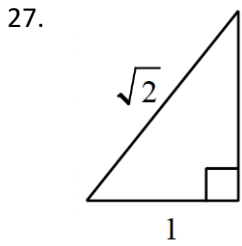
26.



$a =$ _____

$b =$ _____

Given the sides of the right triangle, decide which type of special right triangle it is, ($30^\circ - 60^\circ - 90^\circ$ or $45^\circ - 45^\circ - 90^\circ$). Then write the degree measures of the missing 2 angles in the correct spot. **Triangles are not drawn to scale.**



Draw a reference triangle for the given angle. Pick a number for the hypotenuse. Decide which type of special triangle it is and use the rules to find the missing sides. Give the exact value of each trig function without using a calculator.

36. $\sin 30^\circ =$

37. $\cos 135^\circ =$

38. $\tan 240^\circ =$

39. $\csc 330^\circ =$

40. $\sin \frac{\pi}{3} =$

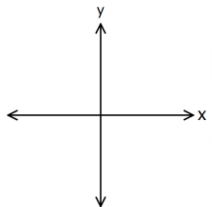
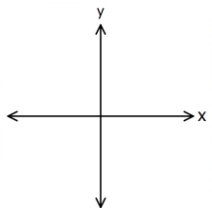
41. $\cot \frac{7\pi}{4} =$

42. $\sec \frac{7\pi}{6} =$

43. $\tan \frac{\pi}{4} =$

Find the acute angles, θ , that satisfy the given equation by drawing the triangles. Give θ in both **degrees** and **radians**. You should do these problems without a calculator.

44. $\sin \theta = \frac{1}{2}$

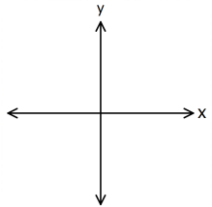
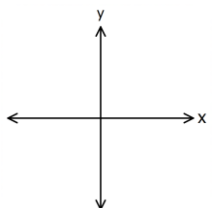


$\theta =$ _____

and

$\theta =$ _____

45. $\cos \theta = -\frac{\sqrt{3}}{2}$

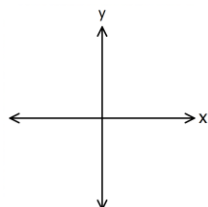
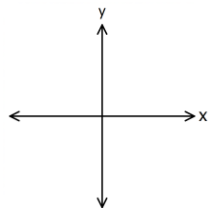


$\theta =$ _____

and

$\theta =$ _____

46. $\tan \theta = -1$

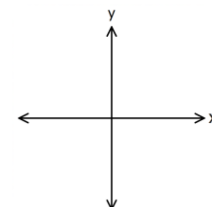
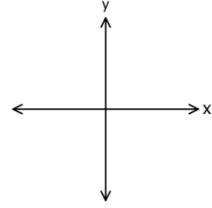


$\theta =$ _____

and

$\theta =$ _____

47. $\csc \theta = -2$

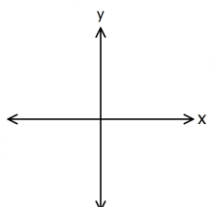
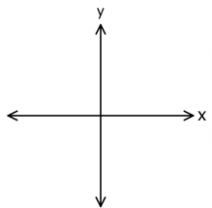


$\theta =$ _____

and

$\theta =$ _____

48. $\cot \theta = \frac{\sqrt{3}}{3}$

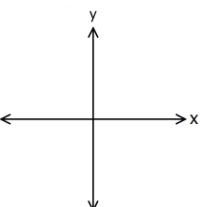
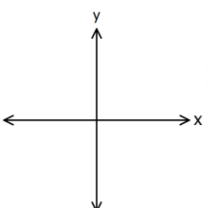


$\theta =$ _____

and

$\theta =$ _____

49. $\sec \theta = 2$

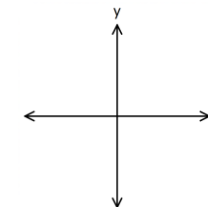
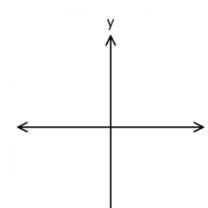


$\theta =$ _____

and

$\theta =$ _____

50. $\tan \theta = -\frac{\sqrt{3}}{3}$

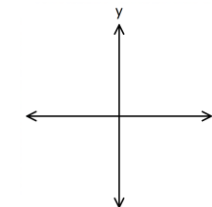
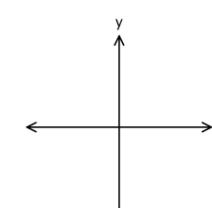


$\theta =$ _____

and

$\theta =$ _____

51. $\cos \theta = \frac{\sqrt{2}}{2}$



$\theta =$ _____

and

$\theta =$ _____

Use a calculator to find the function value to the nearest ten thousandths. Be sure to watch the mode on your calculator.

52. $\sin 74^\circ =$

53. $\cos 19^\circ =$

54. $\tan \frac{\pi}{12} =$

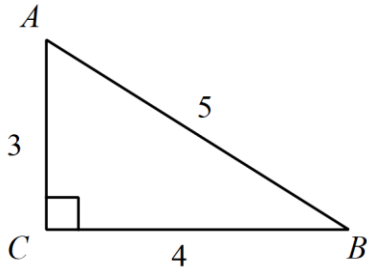
55. $\sec 49^\circ =$

56. $\cot 0.89 =$

57. $\csc \frac{\pi}{8} =$

Find the values of all six trigonometric functions of angle A. Write the fractions in lowest terms. Leave answer in exact form (radicals).

58.



$\sin A =$

$\cos A =$

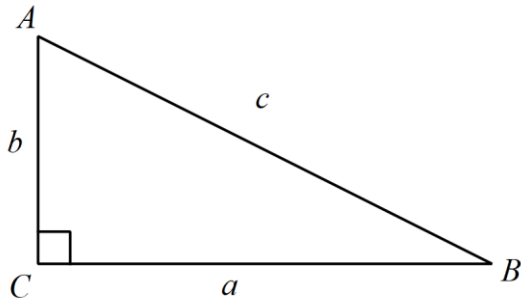
$\tan A =$

$\sec A =$

$\csc A =$

$\cot A =$

59. Solve the right triangle for all missing sides and angles to the nearest tenth.



$a = 12.3$

$A = 20^\circ$

60. From the distance of 43 feet from the base of a building, the angle of elevation to the top of the building is 63° . Estimate the height of the building to the nearest foot.