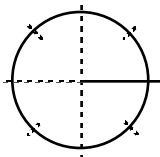


Rationalize all denominators, as necessary.

1. What degree measure represents the given portion of a circle? Draw a central angle that has that same number of degrees.

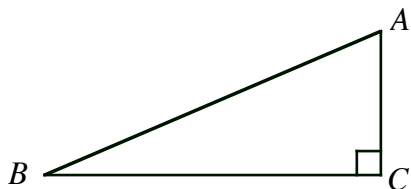
seven-ninths of a circle



2. $\angle ABC$ and $\angle XYZ$ are supplementary angles. Given the measure of $\angle ABC$, find $m\angle XYZ$.

$$m\angle ABC = 102^\circ 28' 15''$$

3. In $\triangle ABC$, $m\angle B = 22^\circ 18' 41''$. Find $m\angle A$.

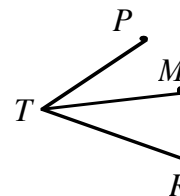


4. $\triangle XYZ$ is an isosceles triangle. $\angle X$ and $\angle Y$ are the congruent base angles. Given $m\angle Z$, find $m\angle X$. (Write the answer in DMS.)

$$m\angle Z = 86^\circ 47'$$

5. At right, \overline{TM} bisects $\angle PTR$.

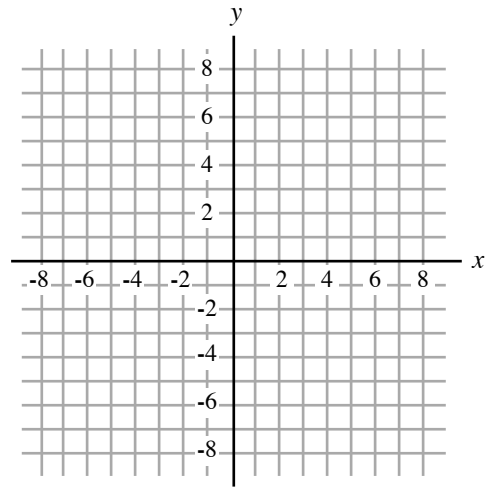
- a) If $m\angle PTM = 28^\circ 43' 52''$, find $m\angle PTR$. b) If $m\angle PTR = 63^\circ 31' 18''$, find $m\angle PTM$.



6. Consider a circle centered at the origin that passes through $(-4, 2\sqrt{5})$.

Note: $2\sqrt{5} \approx 4.5$

- Find the radius of the circle
- Draw its graph.
- What is the equation of the circle?



7. Verify that the given point is on the unit circle.

$$\left(-\frac{5\sqrt{3}}{9}, \frac{\sqrt{6}}{9}\right)$$

8. Use the identity $\sin\theta = \pm\sqrt{1 - \cos^2\theta}$ to find $\sin\theta$.

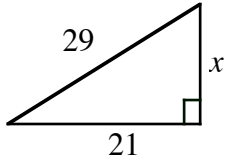
$$\cos\theta = -\frac{\sqrt{5}}{3} \text{ and } \theta \text{ terminates in QIII.}$$

9. The radius of a circle is 4 inches, and the measure of Arc_{AB} is $\frac{20\pi}{3}$. Determine the measure of the central angle that subtends Arc_{AB} .

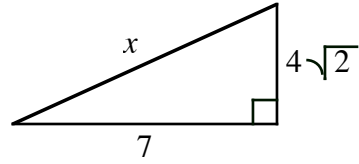
10. The radius of a circle is 6 inches, and the measure of a central angle, $m\angle AOB$ is 80° . Determine the length of the arc it subtends.

Find the value of x in the given triangle and simplify completely.

11.

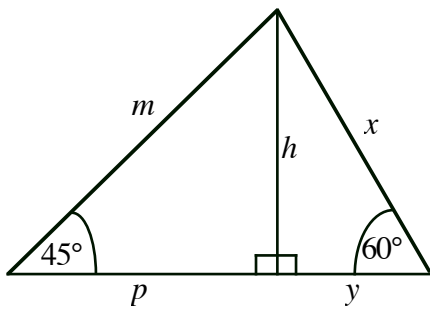


12.



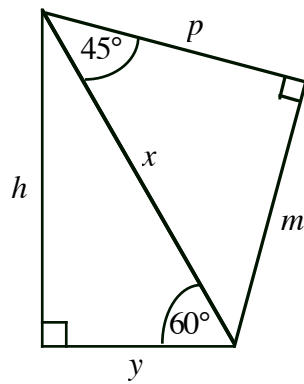
Find the values of h , m , p , x , and y , which represent the lengths of the sides of these triangles. Simplify completely.

13.



- a) $x = 4$ $y =$
 $h =$
 $p =$
 $m =$
- b) $h = 9$ $p =$
 $m =$
 $y =$
 $x =$
- c) $m = 12$ $p =$
 $h =$
 $y =$
 $x =$

14.



- a) $y = 5$ $h =$
 $x =$
 $p =$
 $m =$
- b) $x = 6\sqrt{3}$ $y =$
 $h =$
 $p =$
 $m =$
- c) $h = 9\sqrt{2}$ $y =$
 $x =$
 $p =$
 $m =$

15. Based on the given information, in which quadrant does θ terminate.

a) $\sec\theta < 0$ and $\sin\theta > 0$

b) $\tan\theta > 0$ and $\cos\theta < 0$

c) $\csc\theta > 0$ and $\tan\theta > 0$

d) $\tan\theta < 0$ and $\sin\theta < 0$

e) $\cos\theta < 0$ and $\cot\theta > 0$

f) $\csc\theta > 0$ and $\sec\theta > 0$

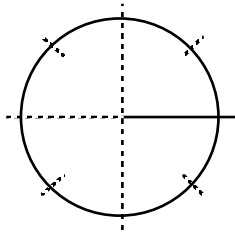
g) $\sin\theta < 0$ and $\sec\theta > 0$

h) $\cot\theta < 0$ and $\cos\theta < 0$

For each given angle measure, (i) locate it in a circle using standard position, and (ii) identify an angle that is coterminal with it and ...

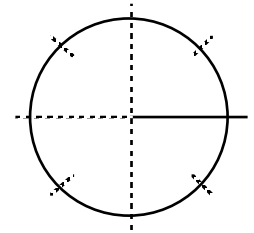
16. between 0° and 360°

$\theta = -240^\circ$



17. between 0° and -360°

$\theta = 980^\circ$



Locate the given point in the x - y -plane, and draw a positive angle θ whose terminal side contains the point. Then, find the values of the six trig functions of θ and simplify.

18. $(3, -\sqrt{7})$

$\sin\theta =$

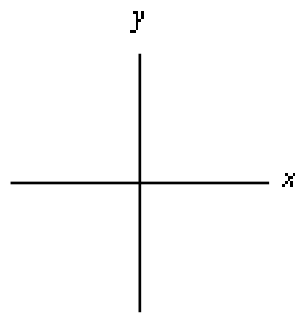
$\cos\theta =$

$\tan\theta =$

$\cot\theta =$

$\sec\theta =$

$\csc\theta =$



What is r ?

19. $(0, 2)$

$\sin\theta =$

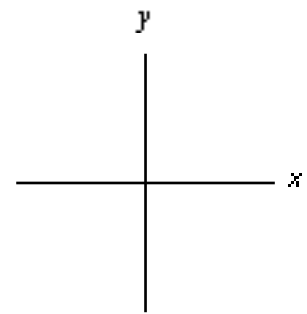
$\cos\theta =$

$\tan\theta =$

$\cot\theta =$

$\sec\theta =$

$\csc\theta =$



What is r ?

Find and simplify the requested trig values based on the information given. Rationalize the denominator, if necessary.

20. If θ terminates in Quadrant IV

and $\cot\theta = -\frac{3}{4}$, find

$$\sin\theta =$$

$$\tan\theta =$$

$$\sec\theta =$$

21. If θ terminates in Quadrant II

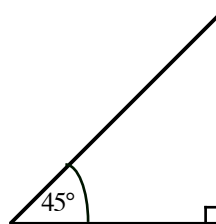
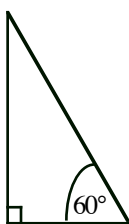
and $\csc\theta = \frac{3}{\sqrt{5}}$, find

$$\sin\theta =$$

$$\cos\theta =$$

$$\tan\theta =$$

22. Use the given triangles and mark them however you wish to assist you in finding the following trig values. (Simplify and rationalize the denominator, if necessary.)



$$\sin 30^\circ =$$

$$\sin 60^\circ =$$

$$\sin 45^\circ =$$

$$\cos 30^\circ =$$

$$\cos 60^\circ =$$

$$\cos 45^\circ =$$

$$\tan 30^\circ =$$

$$\tan 60^\circ =$$

$$\tan 45^\circ =$$

$$\cot 30^\circ =$$

$$\cot 60^\circ =$$

$$\cot 45^\circ =$$

$$\sec 30^\circ =$$

$$\sec 60^\circ =$$

$$\sec 45^\circ =$$

$$\csc 30^\circ =$$

$$\csc 60^\circ =$$

$$\csc 45^\circ =$$

Evaluate each. Simplify; rationalize the denominator, if necessary.

23. $2\sqrt{3} \sin 60^\circ$

24. $\sqrt{\cot 45^\circ}$

25. $\sqrt{\sec 60^\circ}$

26. $(\tan 30^\circ)^2$

27. $(\csc 45^\circ)^2$

28. $\tan 60^\circ \cdot \cos 30^\circ$

Write each in terms of sine and cosine only, and simplify completely.

29. $\sin \theta \cdot \cot \theta + \sec \theta$

30. $\sec \theta - \tan \theta \cdot \sin \theta$