

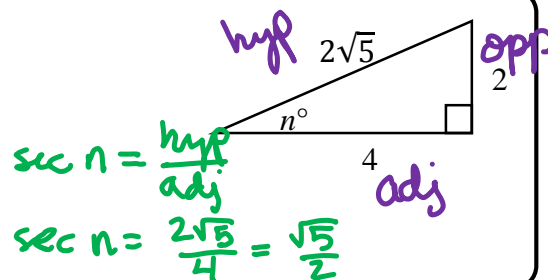
4.3 Circular Functions

Target 5B: Generate the unit circle from special right triangles

Review of Prior Concepts

In the following triangle, what is the value of $\sec n$?

- (A) $\sqrt{5}$ (B) $2\sqrt{5}$ (C) $\frac{\sqrt{5}}{2}$ (D) $\frac{\sqrt{5}}{5}$ (E) $\frac{2\sqrt{5}}{5}$



More Practice

Trigonometric Ratios

- <http://www.regentsprep.org/regents/math/algtrig/att1/trigsix.htm>
- <http://www.themathpage.com/atrig/solve-right-triangles.htm>
- <http://www.mathguide.com/lessons/RightTriTrig.html>
- <https://www.youtube.com/watch?v=I5VbdqRjTXc>

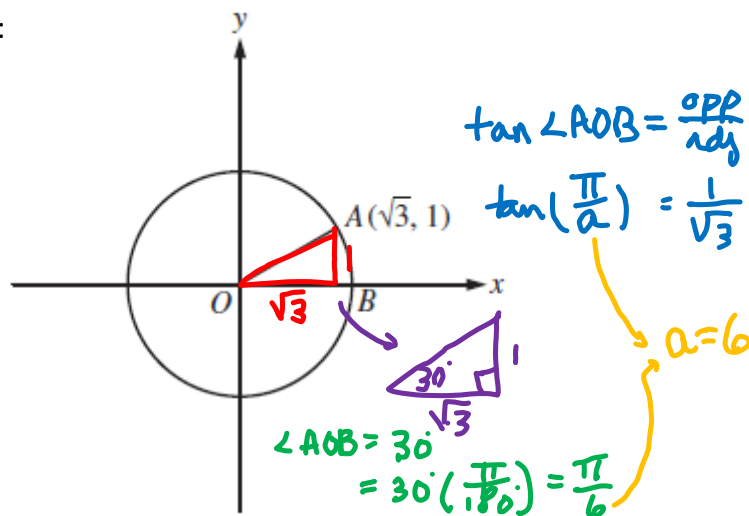


SAT Connection

Passport to Advanced Math

14. Use structure to isolate or identify a quantity of interest in an expression

Example:



6				
/	○	○		
.	○	○	○	○
0	○	○	○	○
1	○	○	○	○
2	○	○	○	○
3	○	○	○	○
4	○	○	○	○
5	○	○	○	○
6	●	○	○	○
7	○	○	○	○
8	○	○	○	○
9	○	○	○	○

NOTE: You may start your answers in any column, space permitting. Columns you don't need to use should be left blank.

In the xy -plane above, O is the center of the circle, and the measure of $\angle AOB$ is $\frac{\pi}{a}$ radians. What is the value of a ?

Solution

Vocabulary

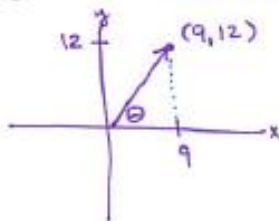
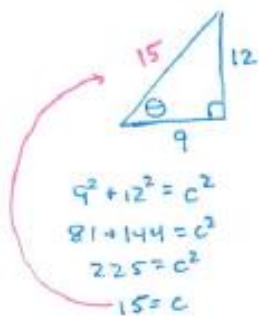


Key Idea	Definition (in your own words)	Sketch/Drawing/Diagram
Initial Side	beginning position of the ray	
Vertex	endpoint of ray	
Terminal Side	final position of the ray	
Positive Angles	counter-clockwise rotations	
Negative Angles	clockwise rotations	
Standard Position	vertex @ origin and initial side on positive x-axis	
Coterminal Angles	angles with <u>same</u> initial side AND <u>same</u> terminal side	

Examples

Sketch the angle θ whose terminal side in standard position passes through the given point, and find the six trigonometric functions for θ .

1. (9,12)



$$\sin \theta = \frac{12}{15}$$

$$\boxed{\sin \theta = \frac{4}{5}} \quad \boxed{\csc \theta = \frac{5}{4}}$$

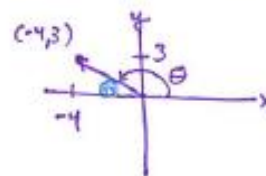
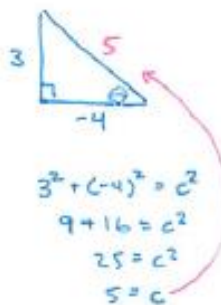
$$\cos \theta = \frac{9}{15}$$

$$\boxed{\cos \theta = \frac{3}{5}} \quad \boxed{\sec \theta = \frac{5}{3}}$$

$$\tan \theta = \frac{12}{9}$$

$$\boxed{\tan \theta = \frac{4}{3}} \quad \boxed{\cot \theta = \frac{3}{4}}$$

2. (-4,3)



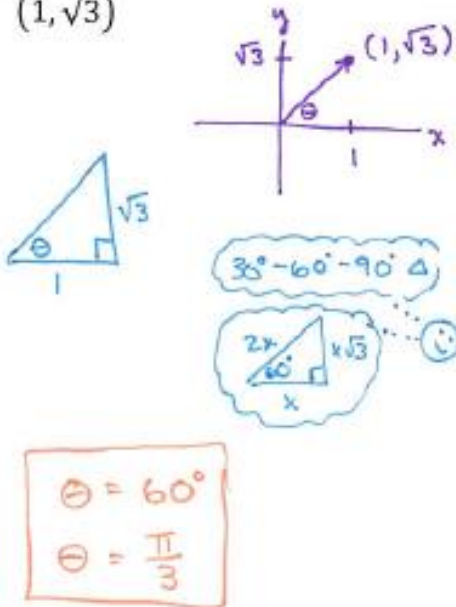
$$\sin \theta = \frac{3}{5} \quad \boxed{\csc \theta = \frac{5}{3}}$$

$$\cos \theta = \frac{-4}{5} \quad \boxed{\sec \theta = -\frac{5}{4}}$$

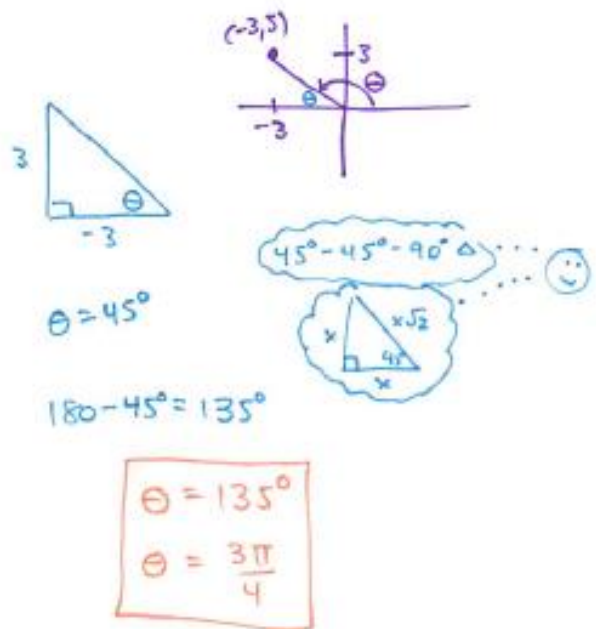
$$\tan \theta = \frac{3}{-4} \quad \boxed{\cot \theta = -\frac{4}{3}}$$

Find the angle that passes through the given point. Give your answer in radians and degrees.

3. $(1, \sqrt{3})$



4. $(-3, 3)$



More Practice

Exact Value of Angles

<http://www.purplemath.com/modules/quadangs2.htm>

<https://www.youtube.com/watch?v=BZwIbvrcbEQ>

<https://www.youtube.com/watch?v=kpcT8lMAOV4>

Homework Assignment

p.383 #1,3,7,10,13,17, 19,25,27,29

SAT Connection**Solution**

The correct answer is 6. By the distance formula, the length of radius OA is $\sqrt{(\sqrt{3})^2 + 1^2} = \sqrt{3 + 1} = 2$. Thus, $\sin(\angle AOB) = \frac{1}{2}$. Therefore, the measure of $\angle AOB$ is 30° , which is equal to $30\left(\frac{\pi}{180}\right) = \frac{\pi}{6}$ radians. Hence, the value of a is 6.