DATE: _____

Unit 5 (Chapter 4): Trigonometric Functions **Pre-Calculus 2016-2017**

4.2 Trigonometric Functions of Acute Angles

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

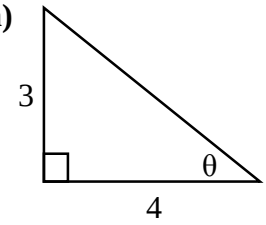
Review of Prior Concepts

1. Convert each radian measure to degrees:

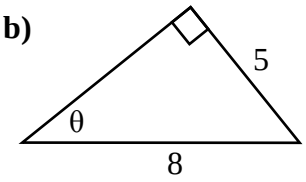
a) $\frac{\pi}{6}$ **b)** $\frac{\pi}{4}$ **c)** $\frac{\pi}{3}$

2. Find the values of $\sin\theta$, $\cos\theta$, $\tan\theta$.

a)



b)



More Practice

Trigonometry

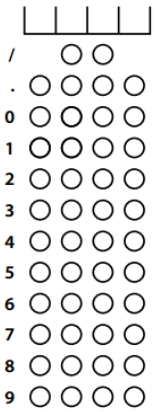
https://www.khanacademy.org/math/trigonometry/trigonometry-right-triangles
http://www.mathsisfun.com/algebra/trigonometry.html
http://www.regentsprep.org/regents/math/algebra/at2/ltrig.htm
http://www.mathgoodies.com/lessons/vol2/circumference.html
https://www.youtube.com/watch?v=SqFQZWRALGc
https://www.youtube.com/watch?v=Jsiy4TxgIME

SAT Connection

Passport to Advanced Math

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

Example: In a right triangle, one angle measures $x°$, where $\sin x° = \frac{4}{5}$. What is $\cos(90° - x°)$?



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

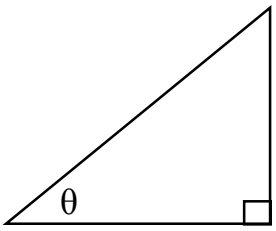
Solution

Six Trigonometric Ratios

$\sin\theta =$ ——— $\csc\theta =$ ———

$\cos\theta =$ ——— $\sec\theta =$ ———

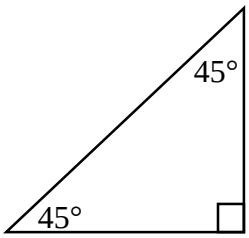
$\tan\theta =$ ——— $\cot\theta =$ ———



Special Right Triangles

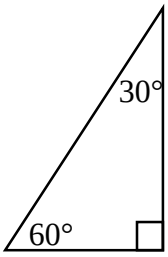
45°–45°–90° Δ

What do you know about a 45°–45°–90° Δ?



30°–60°–90° Δ

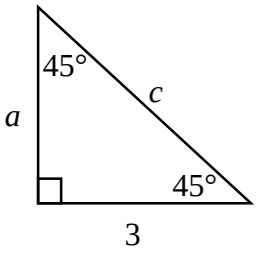
What do you know about a 30°–60°–90° Δ?



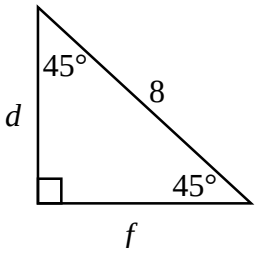
Examples

Find the value of the variables.

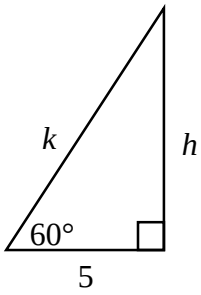
1)



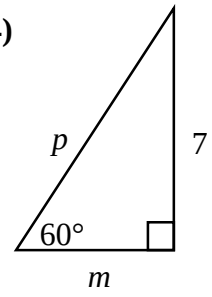
2)



3)



4)



Evaluate without using a calculator:

5) $\tan\left(\frac{\pi}{3}\right)$

6) $\csc\left(\frac{\pi}{4}\right)$

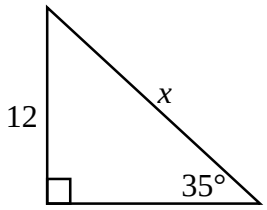
Find the acute angle θ, in both degrees and radians, without using a calculator.

7) $\tan\theta = \sqrt{3}$

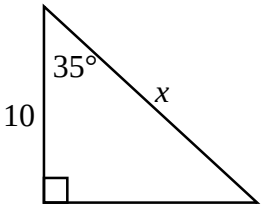
8) $\cos\theta = \frac{\sqrt{3}}{2}$

Find the value of *x* in the triangle.

9)



10)



More Practice

Special Right Triangles

http://www.regentsprep.org/regents/math/algtrig/att2/ltri45.htm
http://www.regentsprep.org/regents/math/algtrig/att2/ltri30.htm
https://www.khanacademy.org/math/trigonometry/trigonometry-right-triangles/trig-ratios-special-triangles/a/trig-ratios-of-special-triangles
https://www.youtube.com/watch?v=Wy_e8QANH_g
https://www.youtube.com/watch?v=2mlsvpox9sI

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=l5VbdqRjTXc

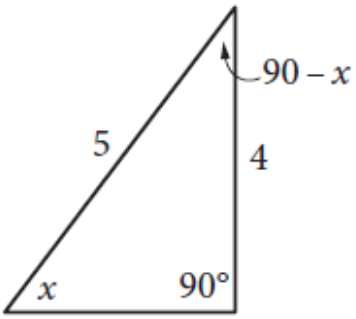
Homework Assignment

p.368 #7,19,22,41,44,47,49,51, 53,61,65

SAT Connection
Solution

The correct answer is $\frac{4}{5}$ or 0.8. By the complementary angle relationship for sine and cosine, $\sin(x°) = \cos(90° - x°)$. Therefore, $\cos(90° - x°) = \frac{4}{5}$. Either the fraction $\frac{4}{5}$ or its decimal equivalent, 0.8, may be gridded as the correct answer.

Alternatively, one can construct a right triangle that has an angle of measure $x°$ such that $\sin(x°) = \frac{4}{5}$, as shown in the figure below, where $\sin(x°)$ is equal to the ratio of the opposite side to the hypotenuse, or $\frac{4}{5}$.



Since two of the angles of the triangle are of measure $x°$ and 90°, the third angle must have the measure $180° - 90° - x° = 90° - x°$. From the figure, $\cos(90° - x°)$, which is equal to the ratio of the adjacent side to the hypotenuse, is also $\frac{4}{5}$.