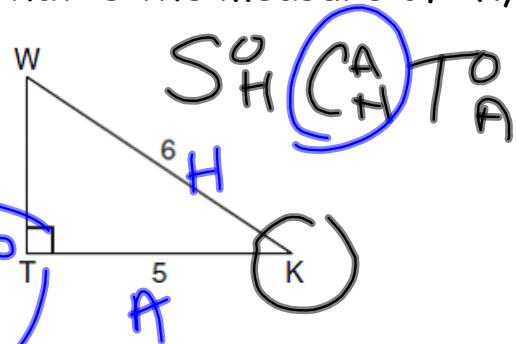


Warm Up: In the diagram below of right triangle KTW, KW = 6, KT = 5, and $m\angle KTW = 90^\circ$. What is the measure of $\angle K$, to the nearest tenth of a degree?

$$\cos K = \frac{5}{6}$$

$$K = 33.6^\circ$$



$$\frac{\sin(\text{gerine})}{\cos(\text{gerine})} =$$



Ans*6

9

Ans*6

54

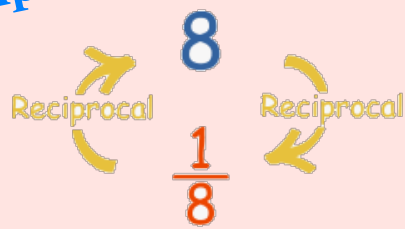
$\cos^{-1}(5/6)$

33.55730976



Reciprocal Functions

What is a reciprocal?



JUST FLIP IT

secant, Reciprocal of cosine

$$\sec \theta = \frac{1}{\cos \theta}$$

cosecant, Reciprocal of sine

$$\csc \theta = \frac{1}{\sin \theta}$$

cotangent, Reciprocal of tangent

$$\cot \theta = \frac{1}{\tan \theta} \quad \text{OR} \quad \frac{\cos \theta}{\sin \theta}$$

1) Simplify completely: $\frac{\sec \theta}{\csc \theta}$

$$\frac{\frac{1}{\cos \theta}}{\frac{1}{\sin \theta}} = \frac{1}{\cos \theta} \div \frac{1}{\sin \theta}$$

$$= \frac{1}{\cos \theta} \cdot \frac{\sin \theta}{1}$$

① Replace in terms of sine & cosine

② Simplify completely

$$\frac{\sin \theta}{\cos \theta} = \tan \theta$$

2) Simplify completely: $(\sec^2 \theta)(\cot^2 \theta)(\sin \theta)$

$$\left(\frac{1}{\cos^2 \theta}\right) \left(\frac{\cos^2 \theta}{\sin^2 \theta}\right) \left(\frac{\sin \theta}{1}\right)$$

$$\frac{1}{\sin \theta} = \csc \theta$$

3) Which ratio represents $\csc A$ in the diagram below?

S^O
 H

$\frac{1}{\sin A}$

$\sin A = \frac{7}{25}$

$\csc A = \frac{25}{7}$

4) In the diagram below of right triangle JTM, $JT = 12$, $JM = 6$, and $m\angle JMT = 90^\circ$.

What is the value of $\cot J$?

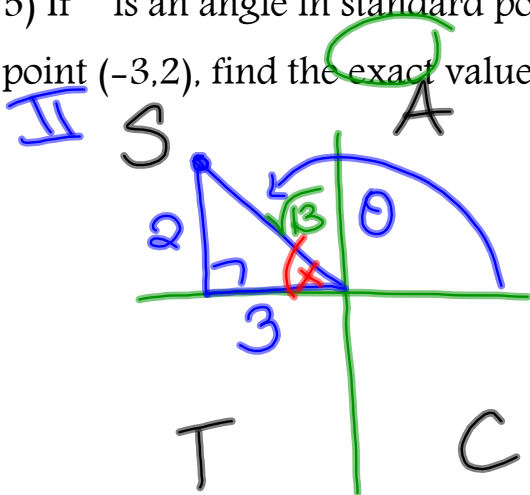
T^O
 A

$\tan J = \frac{6\sqrt{3}}{6} = \sqrt{3}$

$6^2 + b^2 = 12^2$
 $36 + b^2 = 144$
 $\sqrt{b^2} = \sqrt{108}$
 $b = \sqrt{36 \cdot 3}$

$\cot J = \frac{1}{\sqrt{3}}$

5) If θ is an angle in standard position and its terminal point passes through the point $(-3,2)$, find the exact value of $\csc \theta$



So
H

$$2^2 + 3^2 = c^2$$

$$4 + 9 = c^2$$

$$\sqrt{13} = \sqrt{c^2}$$

$$\sin \theta = \frac{2}{\sqrt{13}}$$

$$\csc \theta = \frac{\sqrt{13}}{2}$$

6) Angle θ is an angle in standard position and $(-4,0)$ is a point on the terminal side of θ . What is the value of $\sec \theta$?

Homework: p. 377 #14

In 11–18, P is a point on the terminal side of an angle in standard position with measure θ and on a circle with center at the origin and radius r . For each point P , find: **a.** r **b.** $\csc \theta$ **c.** $\sec \theta$ **d.** $\cot \theta$

14. $(-5, -5)$