Geometry Name Key

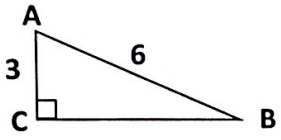
12.1 Trigonometric Ratios HW Day

1 a. Given a right triangle, I can define the sine, cosine, and tangent ratios from an unknown angle.
b. I can use Trigonometric Ratios to solve for unknown sides and angles in a right triangle.

1. The cos 60° is 1/2 . What does this mean? Your explanation should include something about the sides of a right triangle.

In a right $\triangle$ where one angle is 60°, the ratio of the length of the side adjacent to the 60° angle to the hypotenuse is $\frac{1}{2}$.

2. The following statement is a common mistake that students make with trigonometry ratios. What is wrong with this statement? How can the statement be corrected?



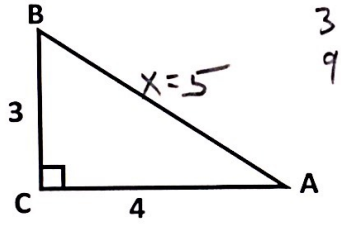
$$\sin\frac{3}{6}=\frac{1}{2}$$

The student did not include an angle in the sine.

$\sin B = \frac{3}{6} = \frac{1}{2}$

Find sin, cos, and tan for each angle in the triangle.

3.



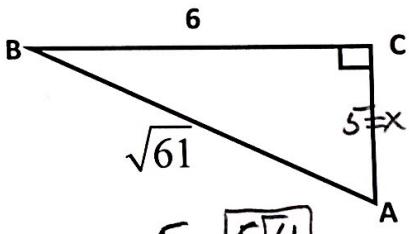
$3^2+4^2=x^2$
$9+16=x^2$
$\sqrt{25}=\sqrt{x^2}$
$5=x$

sin A = 3/5 sin B = 4/5

cos A = 4/5 cos B = 3/5

tan A = 3/4 tan B = 4/3

4.



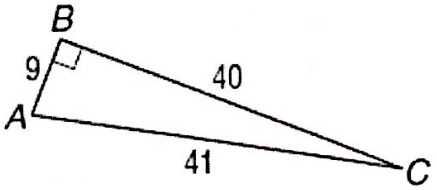
$x^2+6^2=\sqrt{61}^2$
$x^2+36=61$
$x^2=25$
$x=5$

$\sin A = \frac{6}{\sqrt{61}} = \frac{6\sqrt{61}}{61}$ $\sin B = \frac{5}{\sqrt{61}} = \frac{5\sqrt{61}}{61}$

$\cos A = \frac{5}{\sqrt{61}} = \frac{5\sqrt{61}}{61}$ $\cos B = \frac{6}{\sqrt{61}} = \frac{6\sqrt{61}}{61}$

$\tan A = \frac{6}{5}$ $\tan B = \frac{5}{6}$

5.

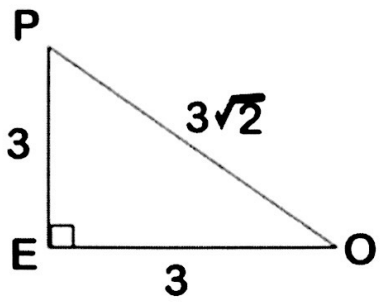


sin A = 40/41 sin C = 9/41

cos A = 9/41 cos C = 40/41

tan A = 40/9 tan C = 9/40

6.



$\frac{3}{3\sqrt{2}} = \frac{1}{\sqrt{2}}$ ← sin P = $\frac{\sqrt{2}}{2}$ sin O= $\frac{\sqrt{2}}{2}$

$= \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$ cos P = $\frac{\sqrt{2}}{2}$ cos O= $\frac{\sqrt{2}}{2}$

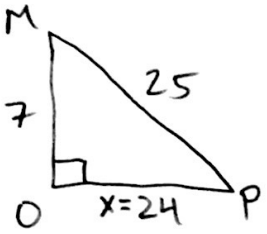
$= \frac{\sqrt{2}}{2}$ tan P = 1 tan O= 1

↓

$\frac{3}{3} = 1$

Answer each question.

7. In ΔMOP, $\angle O$ is the right angle. Suppose $\sin P = \frac{7}{25}$. Find $\sin M$.



$7^2 + x^2 = 25^2$

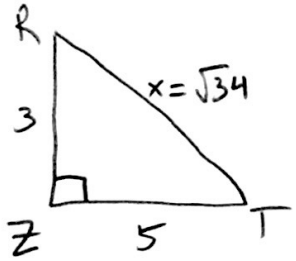
$49 + x^2 = 625$

$\sqrt{x^2} = \sqrt{576}$

$x = 24$

$\sin M = \frac{24}{25}$

8. In ΔRTZ, $\angle Z$ is the right angle. Suppose $\tan R = \frac{5}{3}$. Find $\cos T$.



$5^2 + 3^2 = x^2$

$25 + 9 = x^2$

$34 = x^2$

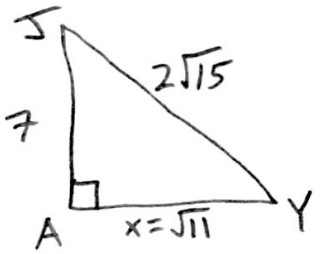
$\sqrt{34} = x$

2 17

$\cos T = \frac{5}{\sqrt{34}}$

$= \frac{5}{\sqrt{34}} \cdot \frac{\sqrt{34}}{\sqrt{34}} = \frac{5\sqrt{34}}{34}$

9. In ΔJAY, $\angle A$ is the right angle. Suppose $\sin Y = \frac{7}{2\sqrt{15}} = \frac{7\sqrt{15}}{30}$. Find $\tan J$.



$7^2 + x^2 = (2\sqrt{15})^2$

$49 + x^2 = 4(15)$

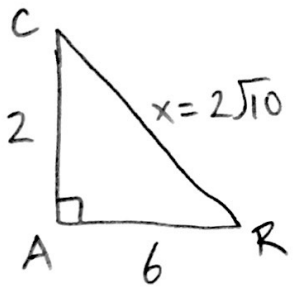
$49 + x^2 = 60$

$x^2 = 11$

$x = \sqrt{11}$

$\tan J = \frac{\sqrt{11}}{7}$

10. In ΔCAR, $\angle A$ is the right angle. Suppose $\tan R = \frac{2}{6} = \frac{1}{3}$. Find $\sin C$.



$2^2 + 6^2 = x^2$

$4 + 36 = x^2$

$40 = x^2$

$x = \sqrt{40} = 2\sqrt{10}$

4 10

2 2 2 5

$\sin C = \frac{6}{2\sqrt{10}}$

$= \frac{3}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}}$

$= \frac{3\sqrt{10}}{10}$