

## Trigonometry Practice

For 1 – 6, use the figures given to find each trigonometric ratio. Express the answers as a fraction and simplify!

1.  $\cos A$

$$\cos A = \frac{15}{5\sqrt{10}}$$

must simplify  
& Rationalize denom.

$$\cos A = \frac{15}{5\sqrt{10}} = \frac{3}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}}$$

$$\frac{3\sqrt{10}}{\sqrt{100}} \rightarrow \cos A = \frac{3\sqrt{10}}{10}$$

2.  $\tan B$

$$\tan B = \frac{15}{5}$$

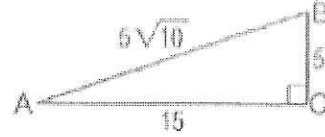
$$\tan B = 3$$

3.  $\sin A = \frac{5}{5\sqrt{10}}$

Simplify  
+ Rationalize

$$\sin A = \frac{5}{5\sqrt{10}} \Rightarrow \frac{1}{\sqrt{10}} \cdot \frac{\sqrt{10}}{\sqrt{10}} = \frac{\sqrt{10}}{100}$$

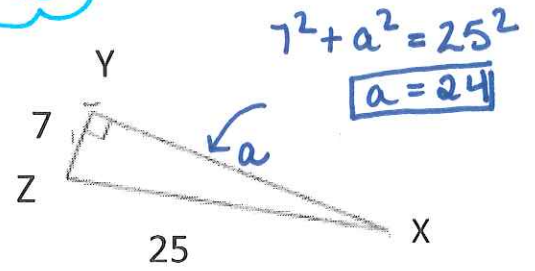
$$\sin A = \frac{\sqrt{10}}{10}$$



4.  $\tan X = \frac{7}{24}$

5.  $\sin Z = \frac{24}{25}$

6.  $\cos X = \frac{24}{25}$



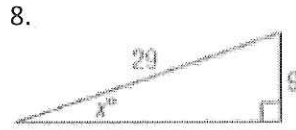
Find x. Round to the nearest tenth.



$$\tan X = \frac{23}{11}$$

$$X = \tan^{-1}\left(\frac{23}{11}\right)$$

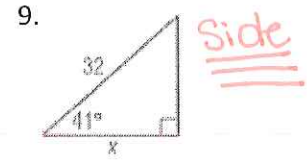
$$X \approx 64.4^\circ$$



$$\sin X = \frac{9}{29}$$

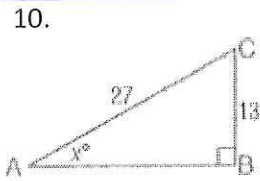
$$X = \sin^{-1}\left(\frac{9}{29}\right)$$

$$X \approx 18.1^\circ$$



$$\cos(41) = \frac{x}{32}$$

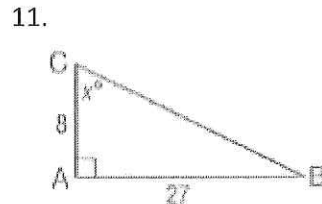
$$x \approx 24.2$$



$$\sin X = \frac{13}{27}$$

$$X = \sin^{-1}\left(\frac{13}{27}\right)$$

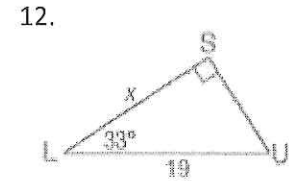
$$X \approx 28.8^\circ$$



$$\tan X = \frac{27}{8}$$

$$X = \tan^{-1}\left(\frac{27}{8}\right)$$

$$X \approx 73.5^\circ$$

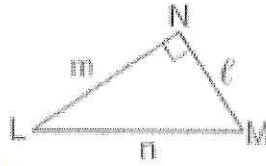


$$\cos(33) = \frac{x}{19}$$

$$x \approx 15.9$$

13. Use Triangle LMN to find  $\sin L$ ,  $\cos L$ ,  $\tan L$ ,  $\sin M$ ,  $\cos M$ , and  $\tan M$ . Express each ratio as a fraction. Simplify all answers!

A.  $\ell = 15, m = 36, n = 39$



B.  $\ell = 12, m = 12\sqrt{3}, n = 24$

must simplify

$\sin L = \frac{5}{13}$

$\sin M = \frac{12}{13}$

$\sin L = \frac{1}{2}$

$\sin M = \frac{\sqrt{3}}{2}$

work  $\frac{12\sqrt{3}}{24}$   
Simplify Fraction only

$\cos L = \frac{12}{13}$

$\cos M = \frac{5}{13}$

$\cos L = \frac{\sqrt{3}}{2}$

$\cos M = \frac{1}{2}$

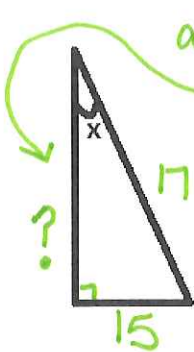
$\tan L = \frac{5}{12}$

$\tan M = \frac{12}{5}$

work  $\rightarrow \tan L = \frac{\sqrt{3}}{3}$   
 $\frac{12}{12\sqrt{3}} = \frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$

$\tan M = \sqrt{3}$   $\left( \frac{12\sqrt{3}}{12} = \frac{\sqrt{3}}{1} \right)$

14. In the right triangle below, if  $\sin x = \frac{15}{17}$ , what is  $\tan x$ ? What is  $\cos x$ ?



$a^2 + 15^2 = 17^2$   
 $a = 8$

$\cos x = \frac{8}{17}$

$\tan x = \frac{15}{8}$

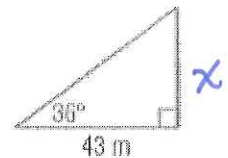
15. Diego used a theodolite to map a region of land for his class in geomorphology. To determine the elevation of a vertical rock formation, he measured the distance from the base of the formation to his position and the angle between the ground and the line of sight to the top of the formation. The distance was 43 meters and the angle was 36 degrees. What is the height of the formation to the nearest meter?

$\tan(36) = \frac{x}{43}$

$x \approx 31.2$

$x \approx 31 \text{ m}$

whole #



### Trigonometry Angles Maze!

**Directions:** Start at the top LEFT. Solve for  $x$ . (Round to hundredths) Use your solutions to make your way through the maze to get to the end. Circle the answers for your route.

The maze consists of a grid of octagons. Some octagons contain trigonometry problems, while others contain numerical answers. The path starts at the top-left octagon labeled "Start!" and ends at the bottom-right octagon labeled "END!".

**Start!**

Row 1:  $x^\circ$  (hypotenuse 22, vertical leg 16), 36.03,  $x^\circ$  (hypotenuse 21, vertical leg 19), 42.14,  $x^\circ$  (hypotenuse 34, horizontal leg 36), 46.64,  $x^\circ$  (hypotenuse 20, vertical leg 16).

Row 2: 46.66, 25.21, 22.33, 38.66.

Row 3:  $x^\circ$  (hypotenuse 36, horizontal leg 24), 28.96,  $x^\circ$  (hypotenuse 16, horizontal leg 14), 61.04,  $x^\circ$  (hypotenuse 19, vertical leg 50), 67.67,  $x^\circ$  (hypotenuse 12, horizontal leg 6).

Row 4: 41.81, 43.07, 62.28, 63.43.

Row 5:  $x^\circ$  (hypotenuse 30, vertical leg 20), 54.68,  $x^\circ$  (hypotenuse 28, vertical leg 41), 55.67,  $x^\circ$  (hypotenuse 43, horizontal leg 20), 47.33,  $x^\circ$  (hypotenuse 25, vertical leg 34).

Row 6: 48.19, 42.51, 30, 42.67.

Row 7:  $x^\circ$  (hypotenuse 38, vertical leg 49), 50.85,  $x^\circ$  (hypotenuse 24, horizontal leg 22), 47.49,  $x^\circ$  (hypotenuse 16, horizontal leg 32), 71.08,  $x^\circ$  (hypotenuse 35, horizontal leg 37).

Row 8: 39.15, 68.2, 60, 18.92.

Row 9:  $x^\circ$  (hypotenuse 21, horizontal leg 12), 34.85,  $x^\circ$  (hypotenuse 20, horizontal leg 8), 66.42,  $x^\circ$  (hypotenuse 16, horizontal leg 19), 57.36, **END!**

### Trigonometry Sides Maze!

**Directions:** Start at the top LEFT. Solve for  $x$ . (Round to hundredths) Use your solutions to make your way through the maze to get to the end. Circle the answers for your route.

The maze consists of a 7x5 grid of octagons. The octagons are arranged in a grid where some are shaded gray and others are white. The white octagons contain either a right-angled triangle problem or a numerical value. The shaded octagons are located at the following grid positions (row, column): (1,2), (1,3), (1,4), (2,1), (2,3), (2,4), (3,1), (3,3), (3,4), (4,1), (4,3), (4,4), (5,1), (5,3), (5,4), (6,1), (6,3), (6,4). The white octagons contain the following content:

- (1,1): Triangle with angle  $38^\circ$ , hypotenuse 20, and side  $x$ .
- (1,2): Value 15.76
- (1,3): Triangle with angle  $39^\circ$ , side 24, and side  $x$ .
- (1,4): Value 19.43
- (1,5): Triangle with angle  $41^\circ$ , side 12, and side  $x$ .
- (1,6): Value 9.06
- (1,7): Triangle with angle  $65^\circ$ , side 12, and side  $x$ .
- (2,1): Value 12.31
- (2,2): Value 10
- (2,3): Value 7.87
- (2,4): Value 25.73
- (3,1): Triangle with angle  $44^\circ$ , side 18, and side  $x$ .
- (3,2): Value 18.64
- (3,3): Triangle with angle  $60^\circ$ , side 20, and side  $x$ .
- (3,4): Value 17.32
- (3,5): Triangle with angle  $38^\circ$ , side 13, and side  $x$ .
- (3,6): Value 17.26
- (3,7): Triangle with angle  $68^\circ$ , side 16, and side  $x$ .
- (4,1): Value 17.38
- (4,2): Value 17.61
- (4,3): Value 10.16
- (4,4): Value 14.83
- (5,1): Triangle with angle  $25^\circ$ , side 20, and side  $x$ .
- (5,2): Value 16.44
- (5,3): Triangle with angle  $54^\circ$ , side 23, and side  $x$ .
- (5,4): Value 18.54
- (5,5): Triangle with angle  $62^\circ$ , side 21, and side  $x$ .
- (5,6): Value 12.43
- (5,7): Triangle with angle  $34^\circ$ , side 16, and side  $x$ .
- (6,1): Value 18.13
- (6,2): Value 13.52
- (6,3): Value 9.86
- (6,4): Value 8.95
- (7,1): Triangle with angle  $48^\circ$ , side 15, and side  $x$ .
- (7,2): Value 41.51
- (7,3): Triangle with angle  $56^\circ$ , side 28, and side  $x$ .
- (7,4): Value 45.67
- (7,5): Triangle with angle  $30^\circ$ , side 34, and side  $x$ .
- (7,6): Value 29.44
- (7,7): Triangle with angle  $52^\circ$ , side 36, and side  $x$ .
- (8,1): Value 20.18
- (8,2): Value 23.21
- (8,3): Value 17.6
- (8,4): Value 46.08
- (9,1): Triangle with angle  $51^\circ$ , side 21, and side  $x$ .
- (9,2): Value 16.32
- (9,3): Triangle with angle  $68^\circ$ , side 16, and side  $x$ .
- (9,4): Value 39.6
- (9,5): Triangle with angle  $47^\circ$ , side 12, and side  $x$ .
- (9,6): Value 8.18
- (9,7): Value 8.18
- (10,7): Value 8.18
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- (97,7): Value 8.18
- (98,7): Value 8.18
- (99,7): Value 8.18
- (100,7): Value 8.18

The path of circled numbers is: 12.31, 18.64, 17.26, 10.16, 18.54, 13.52, 29.44, 17.6, 8.18.

# Trigonometry Ratios (B) Maze!

**Directions:** Start at the top LEFT. Follow the instructions. Use your solutions to make your way through the maze to get to the end. Circle the answers for your route.

**Start!**

<p>Find sin A.</p> <p><math>\frac{24}{25}</math></p>	<p>Find cos B.</p> <p><math>\frac{4}{5}</math></p>	<p>Find tan A.</p> <p><math>\frac{4}{3}</math></p>	<p>Find cos B.</p> <p><math>\frac{12}{13}</math></p>
$\frac{7}{25}$	$\frac{3}{5}$	$\frac{3}{4}$	$\frac{12}{13}$
<p>Find sin B.</p> <p><math>\frac{7}{25}</math></p>	<p>Find cos A.</p> <p><math>\frac{56}{33}</math></p>	<p>Find tan A.</p> <p><math>\frac{33}{56}</math></p>	<p>Find cos A.</p>
$\frac{15}{17}$	$\frac{24}{25}$	$\frac{35}{37}$	$\frac{8}{15}$
<p>Find tan A.</p> <p><math>\frac{40}{9}</math></p>	<p>Find tan B.</p> <p><math>\frac{3}{4}</math></p>	<p>Find cos B.</p> <p><math>\frac{12}{35}</math></p>	<p>Find sin A.</p>
$\frac{9}{41}$	$\frac{4}{3}$	$\frac{12}{37}$	$\frac{55}{73}$
<p>Find sin B.</p> <p><math>\frac{12}{37}</math></p>	<p>Find cos A.</p> <p><math>\frac{9}{40}</math></p>	<p>Find cos A.</p> <p><math>\frac{40}{41}</math></p>	<p>Find sin B.</p>
$\frac{4}{5}$	$\frac{8}{17}$	$\frac{9}{41}$	$\frac{48}{73}$
<b>END!</b>	<p>Find sin A.</p> <p><math>\frac{8}{15}</math></p>	<p>Find tan A.</p> <p><math>\frac{56}{33}</math></p>	<p>Find tan A.</p>