

Geometry CC - Unit 8
Lesson 6: Missing Side w/ Trig
M2.L28

HW: Finish Today's Handout

HW Answers 8.5

Fill in the following trigonometric ratios.

1. $\sin \theta = \frac{opp}{hyp}$ 2. $\cos \theta = \frac{adj}{hyp}$ 3. $\tan \theta = \frac{opp}{adj}$

Write the following ratios in both fractional and decimal (to four places) form.

4. $\sin A = \frac{4}{5} = .8$ 5. $\sin B = \frac{3}{5} = .6$
6. $\cos A = \frac{3}{5} = .6$ 7. $\cos B = \frac{4}{5} = .8$
8. $\tan A = \frac{4}{3} = 1.3333$ 9. $\tan B = \frac{3}{4} = .75$

Find the sine, the cosine, and the tangent of the acute angles of the triangle. Express each value as a decimal rounded to four places.

10. $\sin R = .2491$ 11. $\sin S = .5283$ 16. $\sin X = .5547$ 17. $\sin Y = .8321$
12. $\cos R = .5283$ 13. $\cos S = .2491$ 18. $\cos X = .2521$ 19. $\cos Y = .5547$
14. $\tan R = 1.6071$ 15. $\tan S = .4222$ 20. $\tan X = .6667$ 21. $\tan Y = 1.5$

Feb 9-9:41 AM

In right triangle ABC, $\angle A$ is the right angle and $\sin B = \frac{5}{13}$, find the ratio to represent $\tan C$.

SOH
CAH
TOA

So
h

$$a^2 + 5^2 = 13^2$$

$$a^2 + 25 = 169$$

$$\sqrt{a^2} = \sqrt{144}$$

$$a = 12$$

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

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FINDING MISSING SIDES WITH TRIG RATIOS

Make sure your calculator is in: **DEGREE MODE!**

When solving for a missing side in trig:

- Place x on what you are trying to find.
- Circle the angle you know something about.
- Label each side: opp, adj, hyp
- Write out Soh-Cah-Toa
- Use Soh-Cah-Toa to cross out the sides you know nothing.
- Set up your proportion with the appropriate trig function.
- Put the trig function over 1 and cross multiply.
- Solve for x.

Example: Find x to the nearest tenth:

$$\tan 42 = \frac{x}{15}$$

$$15 \tan 42 = x$$

$$x \approx 13.5$$

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Directions: Solve for x. Round to the nearest tenth.

SOH
CAH
TOA

$$\sin 28 = \frac{x}{19}$$

$$19 \sin 28 \approx x$$

$$x \approx 8.9$$

$$\tan 41 = \frac{x}{32}$$

$$32 \tan 41 \approx x$$

$$x \approx 27.8$$

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$$\cos 21 = \frac{x}{26}$$

$$26 \cos 21 = x$$

$$x \approx 24.3$$

$$\tan 55 = \frac{x}{8}$$

$$8 \tan 55 = x$$

$$x \approx 11.4$$

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$$\sin 33 = \frac{15}{x}$$

$$x \sin 33 = 15$$

$$\frac{x \sin 33}{\sin 33} = \frac{15}{\sin 33}$$

$$x \approx 27.5$$

$$\cos 43 = \frac{36}{x}$$

$$x \cos 43 = 36$$

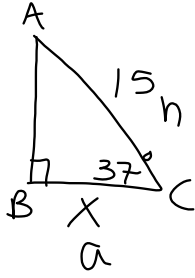
$$\frac{x \cos 43}{\cos 43} = \frac{36}{\cos 43}$$

$$x = 49.2$$

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Word Problems

1) In right triangle ABC, Angle B is the right angle, $AC = 15$, $\angle C = 37^\circ$, find the length of BC to the nearest tenth.



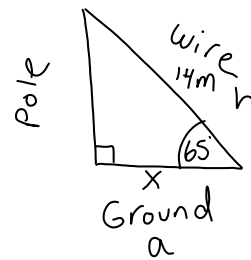
$$\frac{\cos 37}{1} = \frac{X}{15}$$

$$15 \cos 37 = X$$

$$X \approx 12.0$$

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3) A wire reaches from the top of a pole to a stake in the ground. The wire is 14 meters long. The wire makes an angle of 65° with the ground. Find to the nearest tenth of a meter the length from the stake in the ground to the foot of the pole.



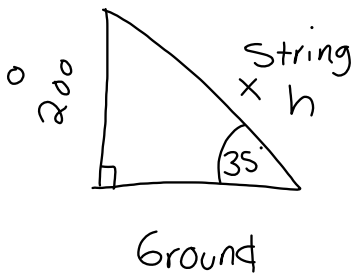
$$\frac{\cos 65}{1} = \frac{X}{14}$$

$$14 \cos 65 = X$$

$$X \approx 5.9 \text{ m}$$

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5) Ann is flying a kite. When the string is secured to the ground, it makes an angle of 35° with the ground. If the kite is 200 feet above the ground. To the nearest tenth of a foot, what is the length of the string?



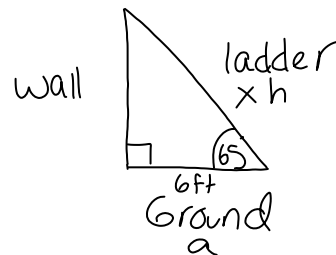
$$\frac{\sin 35}{1} = \frac{200}{X}$$

$$\frac{X \sin 35}{\sin 35} = \frac{200}{\sin 35}$$

$$X \approx 348.7 \text{ ft}$$

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7) A ladder is leaning against a wall. The foot of the ladder makes an angle of 65° with the ground. The length distance from the base of the ladder to the bottom of the wall is 6 feet. Find to the nearest foot, length of the ladder.



$$\cos 65 = \frac{6}{X}$$

$$\frac{X \cos 65}{\cos 65} = \frac{6}{\cos 65}$$

$$X \approx 14 \text{ ft}$$

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