

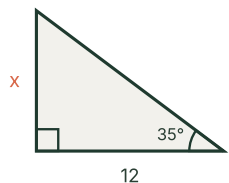
Right Triangle *Trigonometry*

Answer key

HSG.SRT.C.8

14 problems

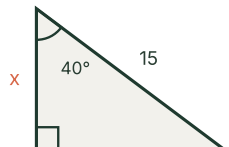
1. Write the equation and find x .



Answer $x \approx 8.4$

Side x is opposite 35° and 12 is adjacent: $\tan 35^\circ = \frac{x}{12}$, so $x = 12 \tan 35^\circ \approx 8.4$.

2. Write the equation and find x .



Answer $x \approx 11.5$

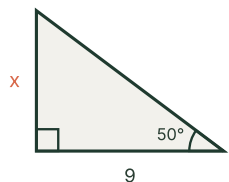
Side x is adjacent to 40° and 15 is the hypotenuse: $\cos 40^\circ = \frac{x}{15}$, so $x = 15 \cos 40^\circ \approx 11.5$.

3. A right triangle has an angle of 28° and a hypotenuse of 20. Find the length x of the side opposite the 28° angle.

Answer $x \approx 9.4$

$\sin 28^\circ = \frac{x}{20}$, so $x = 20 \sin 28^\circ \approx 9.4$.

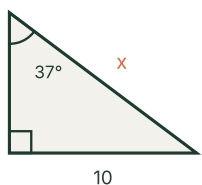
4. Write the equation and find x .



Answer $x \approx 10.7$

Side x is opposite 50° and 9 is adjacent: $\tan 50^\circ = \frac{x}{9}$, so $x = 9 \tan 50^\circ \approx 10.7$.

5. In a right triangle, the side opposite a 37° angle is 10. Find the length x of the hypotenuse.



Answer $x \approx 16.6$

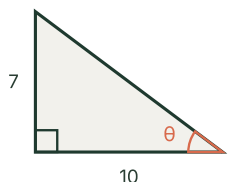
$$\sin 37^\circ = \frac{10}{x}, \text{ so } x = \frac{10}{\sin 37^\circ} \approx 16.6.$$

6. A right triangle has an angle of 25° with an adjacent leg of 18. Find the length x of the hypotenuse.

Answer $x \approx 19.9$

$$\cos 25^\circ = \frac{18}{x}, \text{ so } x = \frac{18}{\cos 25^\circ} \approx 19.9.$$

7. Find the measure of angle θ .



Answer $\theta \approx 35.0^\circ$

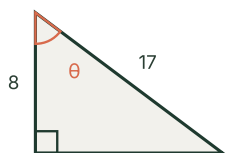
$$7 \text{ is opposite } \theta \text{ and } 10 \text{ is adjacent: } \tan \theta = \frac{7}{10}, \text{ so } \theta = \tan^{-1}(0.7) \approx 35.0^\circ.$$

8. A right triangle has a side of length 9 opposite an angle θ , and a hypotenuse of 15. Find the measure of θ .

Answer $\theta \approx 36.9^\circ$

$$\sin \theta = \frac{9}{15} = 0.6, \text{ so } \theta = \sin^{-1}(0.6) \approx 36.9^\circ.$$

9. Find the measure of angle θ .



Answer $\theta \approx 61.9^\circ$

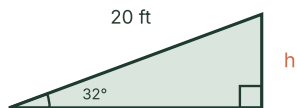
$$8 \text{ is adjacent to } \theta \text{ and } 17 \text{ is the hypotenuse: } \cos \theta = \frac{8}{17}, \text{ so } \theta = \cos^{-1}\left(\frac{8}{17}\right) \approx 61.9^\circ.$$

10. You know one acute angle of a right triangle and the length of the hypotenuse, and you want the side **adjacent** to that angle. Which equation should you use?

Answer B) $\cos \theta = \frac{\text{adj}}{\text{hyp}}$

$$\text{Cosine relates the adjacent side to the hypotenuse: } \cos \theta = \frac{\text{adj}}{\text{hyp}}.$$

11. A skateboard ramp rises at an angle of 32° . The ramp surface (the hypotenuse) is 20 feet long. How high is the top of the ramp?



Answer $h \approx 10.6$ ft

The height is opposite the 32° angle and 20 is the hypotenuse: $\sin 32^\circ = \frac{h}{20}$, so $h = 20 \sin 32^\circ \approx 10.6$ ft.

12. A 18-foot ladder leans against a wall with its base 5 feet from the wall. What angle does the ladder make with the ground?

Answer $\approx 73.9^\circ$

The base (5) is adjacent and the ladder (18) is the hypotenuse: $\cos \theta = \frac{5}{18}$, so $\theta = \cos^{-1}\left(\frac{5}{18}\right) \approx 73.9^\circ$.

13. From a point on the ground 25 feet from the base of a tree, the angle of elevation to the treetop is 40° . How tall is the tree?

Answer ≈ 21.0 ft

The height is opposite and 25 is adjacent: $\tan 40^\circ = \frac{h}{25}$, so $h = 25 \tan 40^\circ \approx 21.0$ ft.

14. A kite is flying on 50 feet of string held taut at 55° above the horizontal. Assuming the string is straight, how high is the kite above the hand holding it?

Answer ≈ 41.0 ft

The height is opposite the 55° angle and the string (50) is the hypotenuse: $\sin 55^\circ = \frac{h}{50}$, so $h = 50 \sin 55^\circ \approx 41.0$ ft.