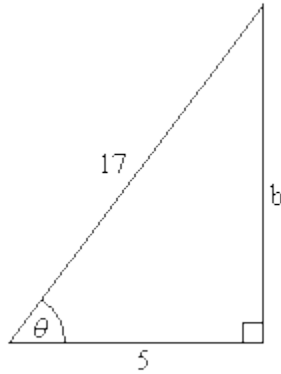
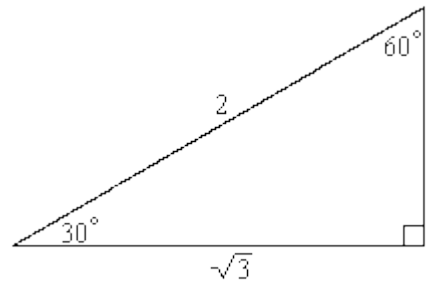
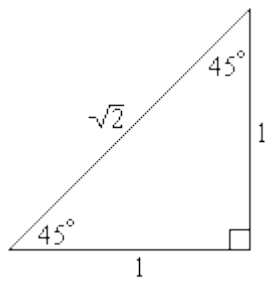


Review Exercise Set 3

Exercise 1: Use the Pythagorean Theorem to find the missing side of the given triangle. Then find the value of the six trigonometric functions of the angle θ .

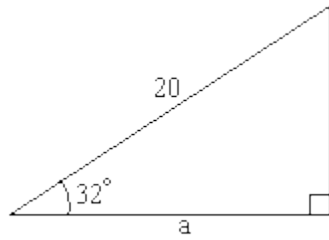


Exercise 2: Use the 45° - 45° and 30° - 60° triangles to evaluate the given expression.



$$\sin 45^\circ + \cos 60^\circ$$

Exercise 3: Use the appropriate trigonometric function to find the value of the side in the given triangle.

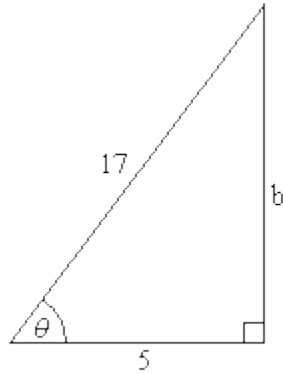


Exercise 4: At a certain time of the day, a building casts a shadow that is 200 feet long. If the angle of elevation of the sun is 30°, find the height of the building to the nearest foot.

Exercise 5: An airplane takes off from San Antonio International Airport and flies at an angle of 10° to the runway. How far has the plane traveled (to the nearest foot) when the plane has reached a height of 350 feet.

Review Exercise Set 3 Answer Key

Exercise 1: Use the Pythagorean Theorem to find the missing side of the given triangle. Then find the value of the six trigonometric functions of the angle θ .



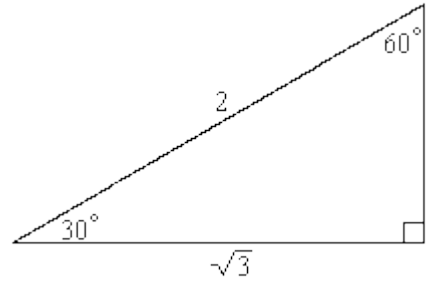
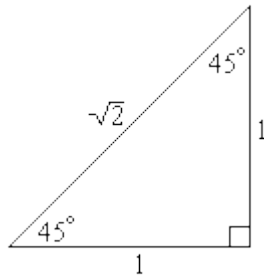
Find b

$$\begin{aligned}a^2 + b^2 &= c^2 \\(5)^2 + b^2 &= (17)^2 \\25 + b^2 &= 289 \\b^2 &= 264 \\b &\approx 16.25\end{aligned}$$

Find the value of the trigonometric functions

$$\begin{aligned}\sin \theta &= \frac{b}{c} & \cos \theta &= \frac{a}{c} & \tan \theta &= \frac{b}{a} \\&\approx \frac{16.25}{17} & &= \frac{5}{17} & &\approx \frac{16.25}{5}\end{aligned}$$
$$\begin{aligned}\csc \theta &= \frac{c}{b} & \sec \theta &= \frac{c}{a} & \cot \theta &= \frac{a}{b} \\&\approx \frac{17}{16.25} & &= \frac{17}{5} & &\approx \frac{5}{16.25}\end{aligned}$$

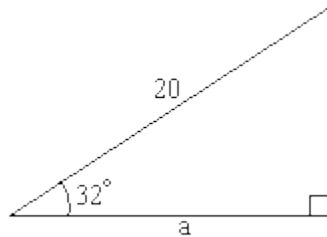
Exercise 2: Use the 45°-45° and 30°-60° triangles to evaluate the given expression.



$$\sin 45^\circ + \cos 60^\circ$$

$$\begin{aligned}\sin 45^\circ + \cos 60^\circ &= \frac{1}{\sqrt{2}} + \frac{1}{2} \\ &= \frac{\sqrt{2}}{2} + \frac{1}{2} \\ &= \frac{\sqrt{2} + 1}{2}\end{aligned}$$

Exercise 3: Use the appropriate trigonometric function to find the value of the side in the given triangle.



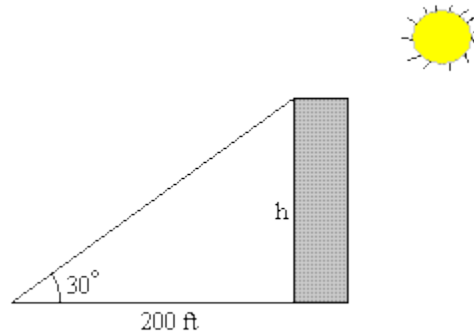
Use the cosine function

The cosine function is used since we need to find the length of the adjacent side with the angle and hypotenuse known.

$$\begin{aligned}\cos 32^\circ &= \frac{a}{20} \\ 20 \times \cos 32^\circ &= a \\ 16.96 &\approx a\end{aligned}$$

Exercise 4: At a certain time of the day, a building casts a shadow that is 200 feet long. If the angle of elevation of the sun is 30° , find the height of the building to the nearest foot.

Draw diagram of the situation



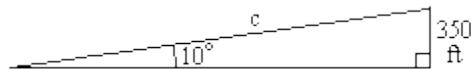
Setup the appropriate trigonometric function to solve for the height of the building

$$\begin{aligned}\tan 30^\circ &= \frac{h}{200} \\ 200 \times \tan 30^\circ &= h \\ 115.47 &\approx h\end{aligned}$$

The building is approximately 115 feet tall.

Exercise 5: An airplane takes off from San Antonio International Airport and flies at an angle of 10° to the runway. How far has the plane traveled (to the nearest foot) when the plane has reached a height of 350 feet.

Draw diagram of the situation



Setup the appropriate trigonometric function to solve for the height of the building

$$\begin{aligned}\sin 10^\circ &= \frac{350}{c} \\ c \times \sin 10^\circ &= 350 \\ c &= \frac{350}{\sin 10^\circ} \\ c &\approx 2015.57\end{aligned}$$

The plane has traveled approximately 2016 feet.