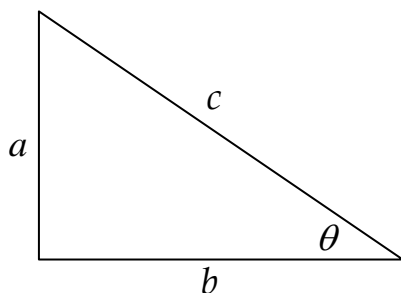


Trigonometry Review

Definitions of Trigonometric Functions:



$$\sin \theta \equiv \frac{a}{c}$$

$$\cos \theta \equiv \frac{b}{c}$$

$$\tan \theta \equiv \frac{a}{b}$$

These definitions are based on properties of similar triangles, where two triangles are similar if their corresponding angles are equal. In particular, two right triangles are similar if they have one acute angle in common. For any two similar triangles the ratio of the corresponding sides is a constant. Therefore, for any two right triangles with the same acute angle θ , the ratios given above will be the same so that the sine, cosine, and tangent of θ will be the same.

Exercise 1. Use the above definitions to show that: $\tan \theta = \frac{\sin \theta}{\cos \theta}$.

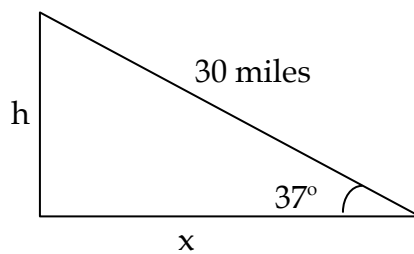
Exercise 2. Use the above definitions and the Pythagorean Theorem to show that:

$$\sin^2 \theta + \cos^2 \theta = 1.$$

Exercise 3. Use the figure and definitions to show that:

$$\sin \theta = \cos(90^\circ - \theta) \quad \text{and} \quad \cos \theta = \sin(90^\circ - \theta).$$

Exercise 4. Use trigonometric function keys on your calculator to find the values of h and x in the figure below.



Exercise 5. Use the trigonometric function keys on your calculator to evaluate the following.

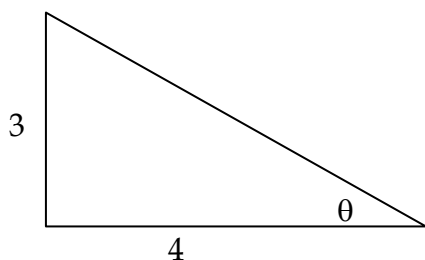
a. $\cos(25^\circ)$ b. $\tan(25^\circ)$ c. $\sin(5^\circ)$ d. $\sin(5 \text{ rad})$

Exercise 6. Use the inverse function keys on your calculator to find the angles whose trigonometric functional values are given as follows

a) $\sin \theta = 0.75$ b) $\sin \theta = 0.90$ c) $\sin \theta = 1.2$ d) $\cos \theta = 0.8$

e) $\tan \theta = 1.2$ f) $\tan \theta = 1.0$ g) $\cos(75^\circ - \theta) = 0.87$

Exercise 7. Find the angle θ in the given figure.



Exercise 8. A man walks from point A on a straight shoreline (where his line of sight of a boat in the water is perpendicular to the shoreline) to another point, B, where his line of sight makes an angle of 28° with the shoreline. The distance between points A and B is 2.5 miles. What are the distances between the boat and the points A and B?

