Name: ____ Date: ______________________________

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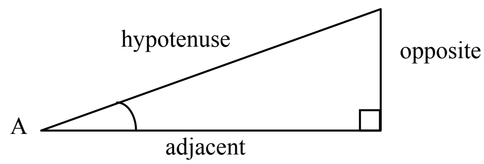
Trigonometry Connections

- A common way to define the trigonometric ratios is to use a right triangle.



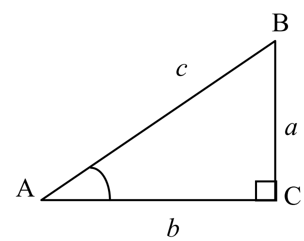
Question

1. Using the triangle above, identify the trigonometric ratios.

sin A = _________________ cos A = _________________ tan A = _________________

____

- Another way to define the trigonometric ratios is to rename the sides of a right triangle using *a*, *b*, and *c*, and the angles at the vertices opposite these sides using capital letters, A, B, and C, as shown. This model of a right triangle is often referred to as the *standard form* of a right triangle. In this model, the right angle is always labelled C.



Questions

2. What is a definition of the trigonometric ratios using this model?

sin A = ______ cos A = ______ tan A = ______

3. Define the trigonometric ratios in terms of angle B using this model.

sin B = ______ cos B = ______ tan B = ______

____

- The value of the given angle measure tells you the accuracy to which you will express the trigonometric function. Use the following rules for rounding.

Given Angle Measure	Accuracy of Trigonometric Function
to the nearest degree	2 significant digits
to the nearest tenth of a degree	3 significant digits
to the nearest hundredth of a degree	4 significant digits

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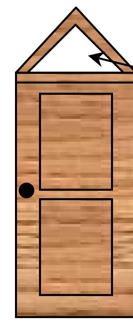
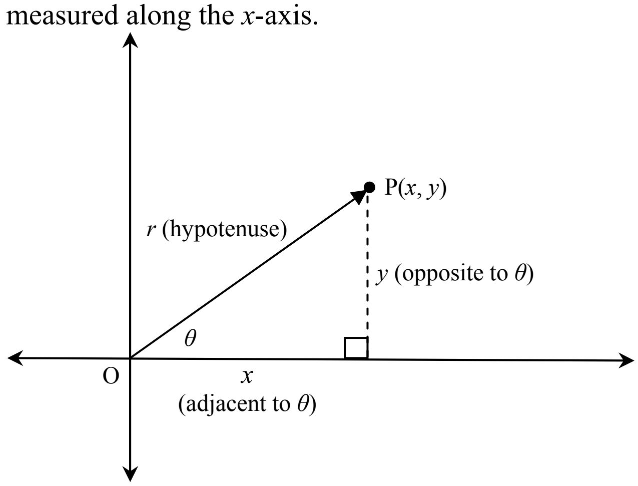
Questions

4. Sketch a right triangle in standard form with lengths $b = 82$ cm and $c = 88$ cm. Determine length a, and angles A and B.

5. An architectural technician is designing an entry door transom in the shape of an isosceles triangle. The base of the transom is 63 cm, and the angle opposite the base measures 94°. What is the measure of the remaining angles? What are the lengths of the remaining sides?



- Trigonometric functions are used in many applications that are periodic in nature. Some of these applications are tidal waves, movements of the sun, and biorhythms. The trigonometric functions can be defined on the Cartesian plane in terms of a point, P(x, y).
  - Make a sketch of the Cartesian plane with point, P(x, y). Draw a vector from the origin, O, to point P. A circle is created if this vector is spun in a counterclockwise rotation. The length of this vector, OP, is the circle's radius. Therefore, this length can be identified as r.
  - Draw a vertical line from this point, P(x, y), to the x-axis. You now have a right triangle positioned on the Cartesian plane with its base along the x-axis.
  - The angle located at the origin, O, can be identified as θ. The side opposite to θ is y and is the distance measured along the y-axis. The side adjacent to θ is x and is the distance measured along the x-axis.



Questions

6. Write the trigonometric ratios in terms of P(x, y).

sin θ = ______ cos θ = ______ tan θ = ______

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(continued)

7. How is r calculated?

8. What restrictions need to be placed on this definition of the tangent function? Why are there no restrictions on the definitions of the sine and cosine functions?

9. Using this equation for sin θ, solve for y. Using this equation for cos θ, determine x. What is a new definition of P, when you substitute these values of x and y into P(x, y)?

10. Plot each of the following points on a Cartesian plane. Determine r and θ, to one decimal place. Determine the value of each trigonometric function, to three decimal places.

a) P(6, 8)
b) P(–15, 7)
c) P(7, –24)
d) P(–5, –2)

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