**Modeling Using Trigonometric Ratios and the Pythagorean Theorem Worksheet**

***Use the Pythagorean Theorem and Trigonometric Ratios to solve the following. You must find the lengths of all the sides and the measures of all the angles.***

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***Create a model for the following. Then use the Pythagorean Theorem and Trigonometric Ratios to solve them. You must find the lengths of all the sides and the measures of all the angles.***

1) A tree casts a shadow 70 feet long at an angle of elevation of 30º. How tall is the tree?

2) An observer on top of a 60-foot tall lighthouse sees a boat in distress at a 5º angle of depression. How far is the boat from the base of the lighthouse?

3) A six-meter-long ladder leans against a building. If the ladder makes an angle of 60° with the ground, how far up the wall does the ladder reach? How far from the wall is the base of the ladder?

***Create a model for the following in Geogebra. Then use the Pythagorean Theorem and Trigonometric Ratios to solve them. You must find the lengths of all the sides and the measures of all the angles. (You can use this page to sketch what your Geogebra model will look like and do any calculations you will need.)***

Your school has decided to build a sidewalk between the Science building and the Café. Right now there is a sidewalk connecting the Science building to the Math building and a sidewalk connecting the Math building to the Café. These sidewalks make a right angle. If the sidewalk between the Science building and the Math building is 10 meters and the new sidewalk will make a 58˚ angle with that sidewalk, how long will the new sidewalk be? How long is the sidewalk between the Math building and the Café? What angle will the new sidewalk make with the sidewalk between the Math building and the Café?