

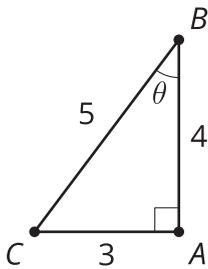
Unit 4 Lesson 9: Using Trigonometric Ratios to Find Angles

1 Once More with the Table (Warm up)

Student Task Statement

A triangle with side lengths 3, 4, and 5 is a right triangle by the converse of the Pythagorean Theorem. What are the measures of the acute angles?

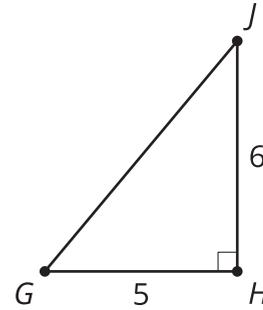
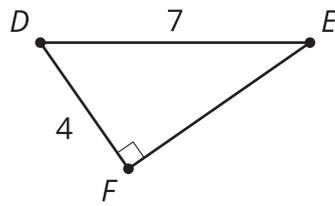
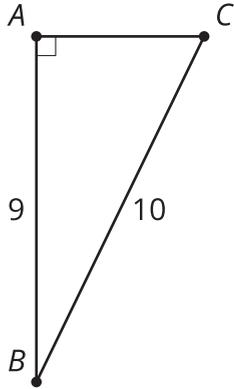
Activity Synthesis



2 From Ratios to Angles

Student Task Statement

Find all missing side and angle measures.



3 Leaning Ladders

Student Task Statement

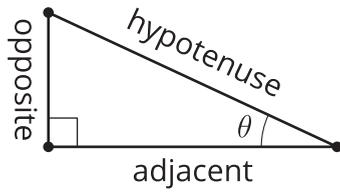
A good rule of thumb for a safe angle to use when leaning a ladder is the angle formed by your body when you stand on the ground and hold your arms out parallel to the ground.

1. What are the angles in the triangle formed by your body and the ladder?
2. What are the angles in the triangle formed by the ladder, the ground, and the railing? Explain or show your reasoning.
3. You have a 13 foot long ladder and need to climb to a 12 foot tall roof.
 - a. If you put the top of the ladder at the top of the wall, what angle is formed between the ladder and the ground?
 - b. Is it possible to adjust the ladder to a safe angle? If so, give someone instructions to do so. If not, explain why not.

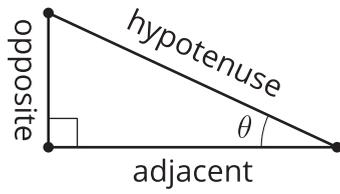


Images for Activity Synthesis

$$\arccos\left(\frac{\text{adjacent}}{\text{hypotenuse}}\right) = \theta$$



$$\arcsin\left(\frac{\text{opposite}}{\text{hypotenuse}}\right) = \theta$$



$$\arctan\left(\frac{\text{opposite}}{\text{adjacent}}\right) = \theta$$

