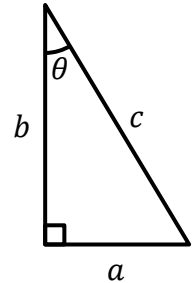																,													
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MATH 2301 GW22: Related Rates #1

A ladder 10 feet long is leaning against a vertical wall.

The foot of the ladder is sliding away from the wall at a speed of 2 ft/sec.

The goal is to find the rate of change of the angle between the ladder and the wall at the instant when the foot of the ladder is 6 feet from the wall, in degrees/second.

(a) Find an equation relating quantities a, c, θ. (Work with letters, not numbers.) Call this Equation 1.

(b) Identify which of the quantities a, c, θ depends on time.

(c) Take the derivative $\frac{d}{dt}(\ )$ of both sides of Equation 1, using Implicit Differentiation (using the chain rule where necessary). The result will be a *new equation* involving quantities a, c, θ as well as the derivatives of any of the quantities that depend on time. Call this Equation 2.

The Group Work continues on back ➜

(d) Solve Equation 2 for $\frac{d\theta}{dt}$.

(e) Substitute in known quantities and known derivatives, along with their correct units. (If there are any quantities that you need that you are not given, you'll have to figure out the values of those quantities.) Simplify the numbers and simplify the units.