

Related Rates Study Group Activity

(Groups of 3 or 4 people)

Purpose of activity: Gain a deeper understanding of related rates by solving a problem on your own and then teaching it to your peers.

Due Date: Monday October 8th.

Individual Portion: Everybody in the group should choose ONE of the problems below. Solve your problem on your own before you meet with your group.

1. All edges of a cube are expanding at a rate of 3 centimeters per second. How fast is the volume changing when the surface area of the cube is 24 square centimeters?
2. A swimming pool is 12 meters long, 6 meters wide, and 1 meter deep at the shallow end. It slants down until it is 3 meters deep at the deep end. Water is being pumped into the pool at $\frac{1}{4}$ cubic meter per minute. When there is 1 meter of water at the deep end, what is the rate of rise of the water level?
3. As a spherical raindrop falls, it reaches a layer of dry air and begins to evaporate at a rate that is twice its surface area. When the radius is 5mm, find the rate of change of the radius.
4. An airplane is flying in still air with an air speed of 240 miles per hour. If it is climbing at an angle of 22° , find the rate at which it is gaining altitude.

Group Portion: Take turns teaching your problem to the rest of the group. Use a whiteboard to clearly show each step to your groupmates. Record your teaching using a phone or camera.

Assessment: Upload your video to Blackboard.