

## Section Summary: 2.8

### a. Properties/Tricks/Hints/Etc.

Strategy for problem solving:

- i. Read the problem carefully
- ii. Draw a diagram if possible
- iii. Introduce notation. Assign symbols to all quantities that are functions of time.
- iv. Express the given information and the required rate in terms of derivatives.
- v. Write an equation that relates the various quantities of the problem. If necessary, use the geometry of the situation to eliminate one of the variables by substitution (as in Example 3).
- vi. Use the Chain Rule to differentiate both sides of the equation with respect to  $t$ .
- vii. Substitute the given information into the resulting equation and solve for the unknown rate.

**Warning:** a common error is to substitute the given numerical information (for quantities that vary with time) too early." (p. 179). Substitute only after the differentiation is complete.

### b. Summary

"In a related rates problem the idea is to compute the rate of change of one quantity in terms of the rate of change of another quantity (which may be more easily measured). The procedure is to find an equation that relates the two quantities and then use the Chain Rule to differentiate both sides with respect to time." (p. 176)

The author does bring in the notions from the Principles of Problem Solving (p. 97), to help us solve these story problems.