

Notes on Related Rates

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.

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.

STRATEGY

1. Read problem carefully
2. Draw a diagram if possible
3. Introduce notation. Assign symbols to all quantities that are functions of time.
4. Express given info and the required rate in terms of derivatives (ex: dv/dt)
5. Write an equation that relates the various quantities of the problem. If necessary, use geometry to eliminate one of the variables by substitution
6. Use chain rule to differentiate both sides with respect to time
7. Substitute given info in resulting equation and solve for the unknown

NOTE: Do not put in any given quantities unless it is fixed-not changing. (ex: ladder is ten feet tall; this does not change)