

Related Rates/Change Variables

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Use this method usually when some rate or ratio is given for one variable in the problem.

1. Draw, then determine "find", "when", and "given".
 2. Using the ratio, solve 1 variable in terms of another.
 3. Substitute that info into the relating equation first, THEN differentiate.
 4. Plug in the "given" and "when", then solve for the "find".
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A inverted cone has a height of 9 cm and a diameter of 6 cm. It is leaking water at the rate of $1 \text{ cm}^3/\text{min}$. Find the rate at which the water level is dropping when $h = 3 \text{ cm}$.

$$V = \frac{1}{3}\pi r^2 h$$