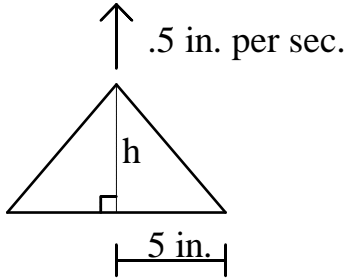# Calculus   Worksheet #4   Unit 7   Selected Solutions

7. A cone has a circular base with a radius of 5 inches and a height of 3 inches. If the height is increasing at .5 inches per second, while the radius of the base remains constant, then how fast is the volume increasing after 4 seconds?

Given: $dh/dt = 0.5$ inches per second

Find: dV/dt after 4 seconds

For a cone, $V = \frac{1}{3}\pi r^2 h$

Given: $r = 5$ inches. $\Rightarrow V = \frac{25}{3}\pi h$

$dV/dt = \frac{25}{3}\pi(dh/dt)$

$dV/dt = \frac{25}{3}\pi(.5) = \frac{25}{6}\pi \approx 13.1$ cu. in. per sec.

The volume is increasing at about 13.1 cubic inches per second.
Note: The volume is increasing at a constant rate.