

Math 121 MPOD - #16
Rates of Change

1. Find the rate of change of the volume of a cube with respect to the length of its side s when $s = 3$ and $s = 5$.
2. Find the rate of change of the surface area of a cube with respect to the length of its side s when $s = 3$ and $s = 5$.
3. The height of a helicopter at time t in minutes is $s(t) = -3t^3 + 400t$ for $0 \leq t \leq 10$. Find the velocity at $t = 6$ and $t = 7$.
4. It takes a stone 3 seconds to hit the ground when dropped from the top of a building. How high is the building and what is the stone's velocity on impact?
5. The demand for beer decreases as the price is raised. Suppose the demand for beer is $B(p) = \frac{900}{p}$ barrels, where p is the price per barrel in dollars. Find the demand when $p = \$40$. Estimate the decrease in demand if p is raised to $\$41$ and the increase in demand to p is decreased to $\$39$.

Answers

1. 27, 75
2. 36, 60
3. 76 ft/min, -41 ft/min.
4. 44.1 meter, -29.4 m/s
5. 22.5 barrels, -.5625 barrels, +.5625 barrels