QUIZ 6 - MATH 112 Friday, October 28

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Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. An open top box with square base is to have a volume of 500 in^3. Find the dimensions of the box that can be made with the smallest amount of materials.

2. A hailstone (small sphere of ice) is forming so that its volume is growing at the rate of 32π mm^3 per minute. How fast is its radius growing at the moment when its radius is 2 mm? (Formula that gives the volume of a sphere V as a function of its radius r is $V = \frac{4}{3}\pi r^3$.)

3. The number of welfare cases in a city of population p is expected to be $W = 0.003p^{4/3}$. If the population is growing by 1000 people per year, find the rate at which the number of welfare cases will be increasing when the population is $p = 1,000,000$.