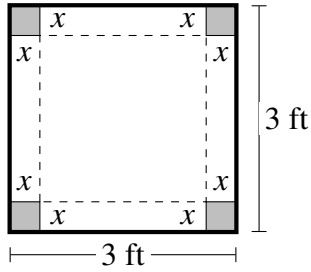


Name: _____

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There are 25 points possible on this quiz. No aids (book, calculator, etc.) are permitted. **Show all work for full credit.**

1. [11 points] An open box is to be constructed by cutting squares out of the four corners of a 3 foot by 3 foot piece of cardboard and folding up the sides. (See the diagram. Note that the box will not have a lid, and the height of the box will be x feet.)



- a. Write an equation for the **volume** of the box in terms of the variable x .
- b. Determine the **dimensions** of the box with the largest volume. Show your work, and use calculus to **justify** that your answer is the maximum. Include units in your final answer. An answer with no clear justification will not receive full credit.

Dimensions: length: _____ width: _____ height: _____

2. [8 points] Evaluate the following limits. You must show your work to earn full credit. If you apply L'Hopital's Rule, you should indicate this.

a. $\lim_{x \rightarrow 0} \frac{3e^x - 3x - 3}{x^2}$

b. $\lim_{x \rightarrow +\infty} x \sin\left(\frac{1}{x}\right)$

3. [6 points] Evaluate the following indefinite integrals.

a. $\int (x^{3/2} + \sin(x) + 5e^x) dx$

b. $\int \left(\sec^2(x) + \frac{x+1}{x} \right) dx$