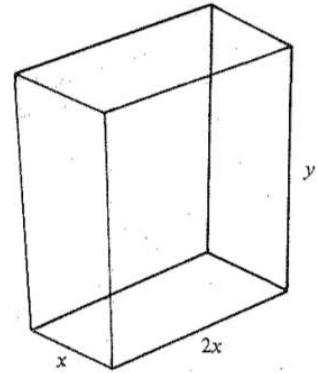


Honors Math 182 Quiz 5 Version A

Feel free to use the computers, your calculator, notes and textbooks while working on this quiz. You may also use online resources such as Wikipedia, Google and Wolfram Alpha; however, do not use email or any other messaging service during the quiz.

1. A 12-foot wire is cut into 12 pieces, which are soldered together to form a rectangular frame whose base is twice as long as it is wide as shown in the figure. The frame is then covered with paper.
 - (i) How should the wire be cut if the volume of the frame is to be maximized?



- (ii) How should the wire be cut if the total surface area of the frame is to be maximized?

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2. Find the following antiderivatives. Use Maple or other technology if needed.

(i) $\int \cos^3 x \, dx$

(ii) $\int \sqrt{1 + \frac{1}{x}} \, dx$

(iii) $\int \frac{x^2 + 1}{x^2 + x - 6} \, dx$

3. Consider the integral $\int_0^4 \sqrt{1 + x^2} \, dx$.

(i) Make the change of variables $x = u^2$ in the above integral.

(ii) Make the change of variables $v = x^2$ in the above integral.