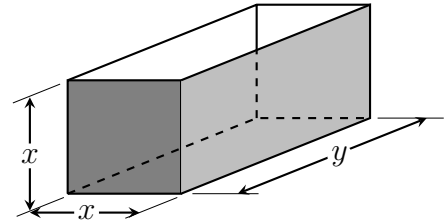1. (12 points) A metal box with two square ends and an open top is to contain a volume of 36 cubic inches. What dimensions x and y will minimize the total area of the metal surface?

2. (8 points) Find $\displaystyle\lim_{x \to 0} \frac{e^{3x} - 1}{x^2 + 3x}$.