1. **Box Problem:** You want to make a open "rectangular" box out of a six by six inch square piece of sheet metal.

   (a) Draw a sketch of the sheet metal square and show where you need to make cuts and folds to produce the box.

   (b) You need to cut out four small squares from the corners of the sheet metal to make the box. Assuming each small square has a side of length x inches, write an equation for the volume of the box.

   (c) Without using your calculator, find the dimensions for the open box with largest volume.

2. **Dessert:** Given $f(x) = x^x$, find $f'(x)$.

   (a) Assume you are writing a multiple choice exam, and the question is Given $f(x) = x^x$, find $f'(x)$. Write a possible answer that might make sense to a beginning Calculus student. Explain why the answer might make sense.

   (b) Repeat part (a) with a different possible answer. Again, explain why this second answer might make sense.

   (c) Find the correct answer. Explain why your answer is actually correct and not just "makes sense."