Here are some sample questions from old tests. Some topics that we covered are not represented by these questions, but are still fair game.

1. A company wishes to manufacture a box with a volume of $6 \ m^3$ that is open on top and has a square base. The material for the bottom of the box costs $3 \ per \ m^2$, while the material for the sides costs $2 \ per \ m^2$. Find the dimensions of the box that will lead to minimum total cost. What is the minimum total cost?

2. Find the absolute maximum and minimum of the function $f(x) = 2x^3 - 3x^2 - 12x + 5$ on the interval $[-2, 0]$.

3. Graph and label the level curves at $z = -1$, $z = 1$, and $z = 2$ for the equation $zx^2 - y = 0$.

4. Let $f(x,y) = x(y^2 + 3)^5 + \frac{1}{y} + 2x^6 - 9$. Compute:

   (a) $f_x(x,y) =$

   (b) $f_y(x,y) =$

   (c) $f_{xx}(x,y) =$

   (d) $f_{xy}(x,y) =$