Contour Map and 3D Model Project

Preliminary questions:

1. Make a contour map of , for c=0,5,10,15, 20, 25. Make sure the z values are labeled and it is scaled accurately.
2. Given the function,
3. Make a 3-d sketch of . Describe this shape in a sentence.

Project: This project is graded as a major group quiz. It is due a week from the start date.

The temperature *T* (in °C) at any point in the region -5 ≤ *x* ≤ 5, -5 ≤ *y* ≤ 5 (neither x nor y can equal zero) is given by the function .

1. Sketch a cross section for y=1 and y=2. Explain in a few sentences what information is learned from the cross section
2. Sketch isothermal curves (curves of constant temperature) for *T* = 5°C, *T* = 35°C, *T* = 65°C, *T* = 95°C, *T* = 125°C, *T* = 155°C, and *T* = 185°C.
3. Use the cardboard to create a 3-d model of the temperature function. This model should have accurate dimensions and be visually appealing. The model should be large, and the contour levels should be obvious.
4. If a heat-seeking bug is put down at the point (1,2) on the temperature curve, in which direction should the bug travel to get warmer. Indicate this on your 3-d model by drawing an *x* for the bug and an arrow for the direction of travel.
5. As *x* and *y* both approach infinity, the contour lines start getting infinitely close together. Explain this. In this explanation, also explain why x and y cannot equal zero.

Presentation of the project:

The graphs from 1 and 2 should be neatly drawn and inconspicuously taped to the outer edge of the model (question 3).

Question 4 should be drawn on the model. Then, on the outer edge of the model, write a sentence explaining your answer.

Question 5 should be typed and inconspicuously taped to the outer edge of the model (question 3).