

## Written Homework 12

Math 126

Solve each of the following problems. Write your solutions clearly and neatly on separate paper, explaining your reasoning with complete sentences. Submit your work either in class or in the homework mailbox (RMS level 3, near the fireplace) by 4:00pm on **Friday, November 8**.

1. Describe in words the region of 3D space represented by each of the following:

(a)  $y = 2$

(b)  $x^2 + y^2 + z^2 \leq 1$

(c)  $x^2 + z^2 \geq 3$

2. Suppose that all of the level curves of the graph of  $z = f(x, y)$  are concentric circles. Does this imply that the graph of  $f$  is a hemisphere? Illustrate your answer with an example.

3. Sketch each of the following vectors  $\mathbf{u}$  and  $\mathbf{v}$  as best you can on a 3D coordinate system. Then find the sum  $\mathbf{u} + \mathbf{v}$  and sketch this new vector on your coordinate system as well.

$$\mathbf{u} = \langle 2, 0, 4 \rangle$$

$$\mathbf{v} = \langle 0, 2, 1 \rangle$$