Minitest 4A - MTH 1420

Dr. Graham-Squire, Spring 2013

Name: _____

I pledge that I have neither given nor received any unauthorized assistance on this exam.

_____

(*signature*)

DIRECTIONS

1. Show all of your work and use correct notation. A correct answer with insufficient work or incorrect notation will lose points.
2. Read the questions carefully, and make sure you answer all parts.
3. Clearly indicate your answer by putting a box around it.
4. Cell phones and computers are <u>not</u> allowed on this test. Calculators <u>are</u> allowed on the last 2 questions, however you should still show all of your work to receive full credit. If you are asked to integrate something, I expect you to integrate it by hand unless otherwise specified. Calculators are not allowed on the first 3 questions, and once you turn in the non-calculator portion you cannot go back to it.
5. Give all answers in exact form, not decimal form (that is, put π instead of 3.1415, $\sqrt{2}$ instead of 1.414, etc) unless otherwise stated.
6. Make sure you sign the pledge.
7. Number of questions = 5. Total Points = 40.

1. (8 points) Match the equation with the graph.

   (a) $9x^2 - 6y^2 + 9z^2 = 36$

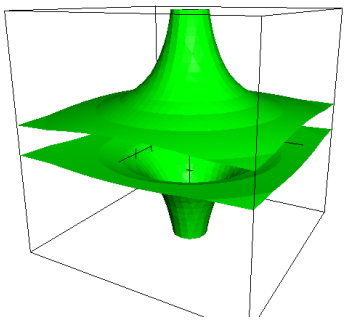
   (b) $x^2 - 25y^2 = 9z^2 + 36$

   (c) $y^2 + z^2 = 25$

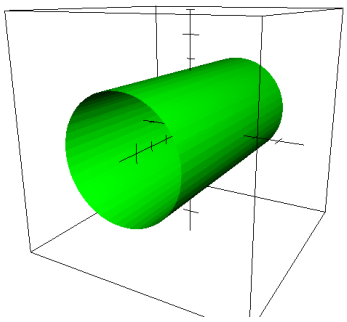
   (d) $10y = 10z^2 - x^2$

   (e) $x^2 + y^2 = \dfrac{1}{z^2}$

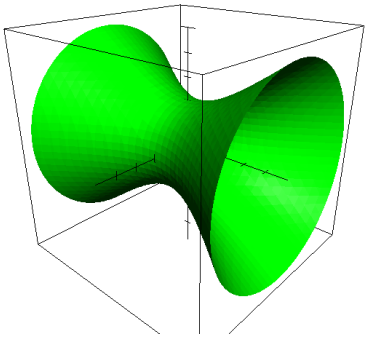
(i)



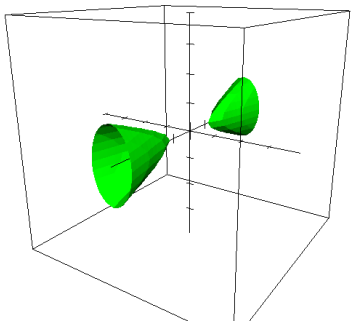
(ii)



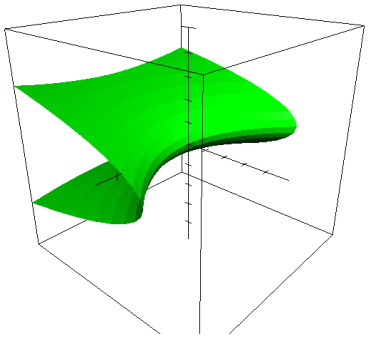
(iii)



(iv)



(v)



2. (8 points) (a) Convert the equation $x^2 + y^2 + z^2 = 36$ from rectangular to spherical coordinates. Explain why the equation in spherical coordinates makes sense.

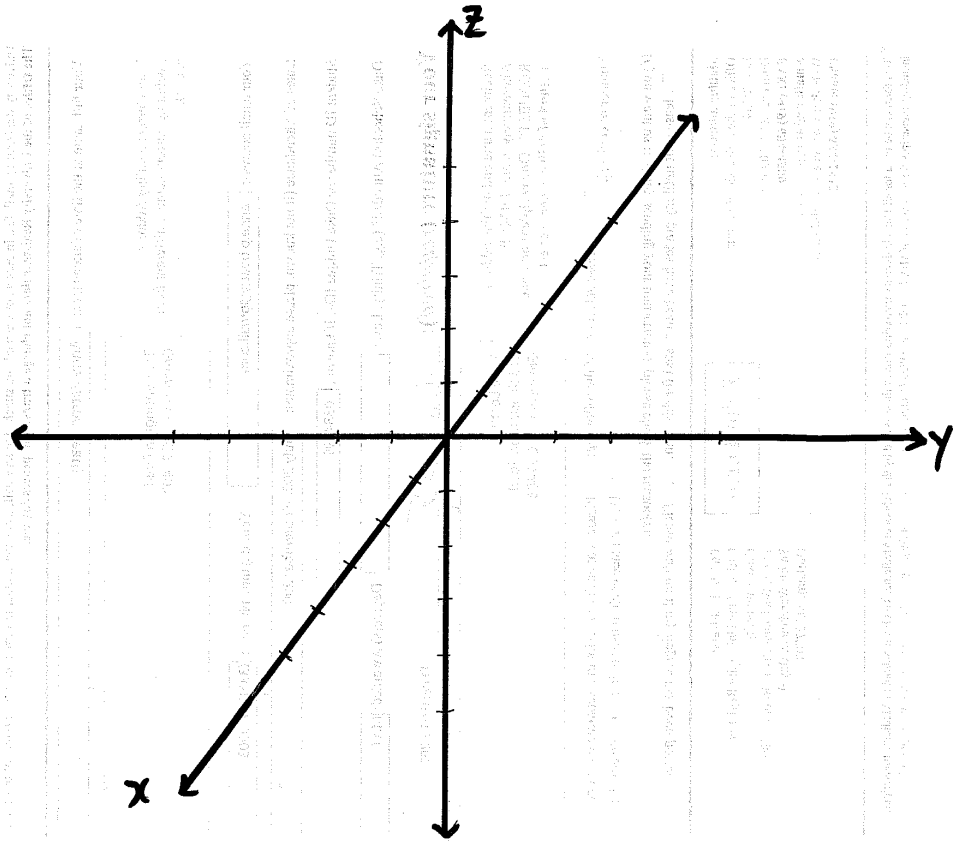
(b) Convert the point $(-2\sqrt{3}, -2, 5)$ from rectangular to cylindrical coordinates.

3. (8 points) Plot the following points on the given set of 3-D axes:

   (A) Rectangular coordinates: (-1, -3, 2)

   (B) Cylindrical coordinates: $(4, \frac{\pi}{4}, -2)$.

   (C) Spherical coordinates: $(3, \pi, \frac{\pi}{2})$



Calculators are okay

Name: _____ Test A

4. (8 points) Find the Taylor series for $f(x) = \ln(2 + x)$ centered at $a = -1$. Simplify your expression to simplest terms. Hint: Find the first 5 or 6 derivatives and then look for a pattern to represent $f^{(n)}(a)$.

5. (8 points) (a) Find the Maclaurin series representation for $\cos(x^2)$.

(b) How many terms of the series you found in (a) are needed to get an error of less than 0.0001 on the interval [-0.7,0.7]? Justify your reasoning.

Extra Credit(1 point) Calculate the first three terms of the Maclaurin series for $(e^x)(\frac{1}{1-x})$.