MATH 275 – Section 001 – Quiz 1

You may work with other class members on this quiz, but you may *not* receive assistance from people not in MATH 275 (Section 001). You must show all of your work to receive full credit. Do all your work on other sheets of paper and be sure to staple all the pieces of paper together or YOU WILL GET A 'ZERO' ON THE QUIZ. Do not use decimal approximations unless asked to do so. Your work on this quiz must be handed in by Tuesday, 3 September 2002 at 9:40 a.m. GOOD LUCK!

1) Consider the triangle whose vertices are the points $(1, -2, 4)$, $(-5, -12, 10)$, and $(10, 13, -5)$.

a) Prove that this triangle is isosceles.

b) Is this triangle equilateral? Explain.

2) Do the points $(0, 2, 3)$ $(3, -4, -2)$ $(-10, 3, 7)$ all lie on the same line? Explain.

3) What is the (shortest) distance from the point $(1, 2, 3)$ to

a) the x-z plane?

b) the x axis?

4) Write a sentence (or two) to precisely describe the surface whose equation is

$$x^2 + y^2 + z^2 - 4x + 6y - 2z + 10 = 0.$$

5) Find all unit vectors parallel to the vector $\begin{bmatrix} 1 \\ -3 \\ 2 \end{bmatrix}$.

6) Do problem 34 on page 796 in the text. However, let's change the numbers. The rope on the left is now 4 m long; the rope on the right is 6 m long. The rope on the left makes an angle of 60 degrees with the horizontal; the rope on the right makes an angle of 45 degrees with the horizontal. The decoration has a mass of 8 kg. Give exact answers and decimal approximations.

Be careful. We did an example like this one in class, where we were given the *weight* of an object. In this example, you are given the *mass* of an object. Mass and weight are NOT the same. How are they related?