Math 2934 homework

1. (due 8/26) Be sure you know how to do any of 13.1 # 1-18 (but ignore #9, as we will have much better ways to do that later on). Hand in 13.1 # 4, 10, 12, 17. Also be able to do any of 13.1 # 23-30, no need to hand any in. Also hand in 13.1 #38, 39.

2. (due 8/30) Be sure you know how to do any of 13.2 # 1-31. Hand in 24 (first find a unit vector in the same direction, then multiply it by 6), 25, 26, 35, 41, 45

3. (due 9/1) Be able to do any of 13.3 # 1-28, 35-40. Hand in 13.3 # 1, 6, 10, 17, 24, 36 (draw a sketch illustrating them), 51, 60 (hint: use the calculation $(\vec{u} + \vec{v}) \cdot (\vec{u} - \vec{v}) = \vec{u} \cdot (\vec{u} - \vec{v}) + \vec{v} \cdot (\vec{u} - \vec{v}) = \vec{u} \cdot \vec{u} - \vec{u} \cdot \vec{v} + \vec{v} \cdot \vec{u} - \vec{v} \cdot \vec{v} = \vec{u} \cdot \vec{u} - \vec{v} \cdot \vec{v} = \|\vec{u}\|^2 - \|\vec{v}\|^2$. Be sure you know which properties on page 815 are being used in the steps in this calculation).

4. (due 9/7) Hand in 13.4 # 5-7, 13-16, 18, 31.

5. (9/7) Be able to calculate cross products quickly and accurately. Hand in 13.4 # 20 (using the cross product) and 49(a)(b) (give *specific* examples showing that (a) and (b) are false).

6. (9/7) Hand in 13.5 # 1, 4, 8, 10, 20, 22, 43, 46. Do more of any kinds that give you difficulty.

7. (9/9) Be able to do 13.5 # 23-38, 43-46, 49-61. Hand in 13.5 # 26, 31, 37, 43, 45, 50, 52, 54, 55, 59, 61.

8. (9/9) Get caught up on 13.1-13.5. Study the discussion of conic sections that was given in Wednesday's lecture. In order to analyze quadric surfaces, we will need to know how to graph the standard forms of conic sections. You do not need to turn these in, but to prepare for Friday's lecture, try analyzing and graphing the following conic sections: $9x^2 - y^2 = 9 + k^2$ (start by rewriting it as $\dfrac{x^2}{\frac{9+k^2}{9}} - \dfrac{y^2}{9 + k^2} = 1$ and find the intercepts and asymptotes), $x^2 + \dfrac{z^2}{4} = \dfrac{k^2}{4} - 1$ (start by noting that if $|k| < 2$ the graph is empty, if $k = \pm 2$ the graph consists only of the origin, and if $|k| > 2$ then start by rewriting the equation as $\dfrac{x^2}{\frac{k^2}{4} - 1} + \dfrac{z^2}{4 \left(\frac{k^2}{4} - 1\right)} = 1$).

9. (9/16) 13.6 # 1, 3, 15, 18, 19, 21-28. Also 29, 35, and 36, but just put them into one of the standard forms, do not sketch (unless you want to sketch them for fun).

10. (9/16) 14.1 # 1, 2, 7 (how are x and y related?), 9 (a helix), 10, 11 ($4y^2 + z^2 = 4$), 19-24, 36 (write x and y in terms of t, then z), 38 (put $x = t$, then express y and z correspondingly in terms of t), 41, 42