A Summary of topics for discussion.

Note that some of these may not be covered on the indicated days. So, this is more of a target.

2 September 2014

2.1 Sep. 3

- Catch up with old material.
- Working definition of a cross product.
- Equation of a line in space.

$$\mathbf{r} = \mathbf{r_0} + \mathbf{t}\,(\mathbf{r_1} - \mathbf{r_0}) = (\mathbf{1} - \mathbf{t})\mathbf{r_0} + \mathbf{t}\mathbf{r_1}.$$

- Special forms of line in plane and three space.
- Equation of a plane.

$$\mathbf{n} \cdot (\mathbf{r} - \mathbf{r_0}) = \mathbf{0}.$$

- Equation of a plane in parametric form. $\mathbf{r} = \mathbf{r_0} + \mathbf{s}\mathbf{v} + \mathbf{t}\mathbf{w}$. If we eliminate parameters s, t, then we get

$$(\mathbf{r} - \mathbf{r_0}) \cdot v \times w = 0.$$

2.2 Sep. 5

- Quick review of determinants.
- Definition of cross product $v \times w$.
- Triple product $u \cdot (v \times w) = (u \times v) \cdot w$.
- Properties of $v \times w$.
- Normal to a plane and vectors in (along) a plane.
- Signed distance to a plane $ax + by + cz - d = 0$ from a point (p, q, r) is given by

$$\frac{ap + bq + cr - d}{\sqrt{a^2 + b^2 + c^2}}$$

where the sign helps decide if given points are on the same or opposite sides of the plane.

To be continued ...