Things you should know from 11.4, 5, 6:

11.4

- How do you compute a cross product given two vectors **a** and **b**?

- How do you compute the determinant of a 2×2 matrix? A 3×3 matrix? Use your favorite method.

- How do you compute the cross product of two vectors **a** and **b** when you only known the magnitudes of each and the angle between them?

- What is the 'right hand rule'? Why is this useful for cross products?

- What is the result of a cross product? A vector? A scalar? Be careful with your notation!

- How can the cross product be used to determine if two vectors are parallel?

- What is true about a vector $\mathbf{c} = \mathbf{a} \times \mathbf{b}$ and the vectors **a** and **b**?

- How can cross products be used to determine the area of a parallelogram / triangle?

- How can cross products and dot products be used to determine the volume of a parallelepiped?

11.5

- How are lines in 3-space related to lines in 2-space? That is, what two things do you need to define a line? (You should have two answers to this question.)

- Know the three representations of a line: vector equation, symmetric equations, parametric equations.

- Know how to use your 'decoder ring' to obtain the slope / direction vector **L** and a point from each of the three representations of a line.

- Does a line have a unique representation in terms of the three equations (vector equation, symmetric equations, parametric equations)? For example, can two different vector equations encode the same line?

- Given a line and a point not on that line, how do you compute the perpendicular distance from the point to the line?

- How do you tell if two lines are parallel?

- How do you determine the intersection point between two lines, if any?

11.6

- What two things do you need to define a plane? (You should have two answers to this question.)

- What is the equation for a plane? How is this related to the normal vector $\mathbf{N}$ of the plane and a point on the plane?

- Know how to use your 'decoder ring' to determine the normal vector and a point on the plane given the equation for the plane.

- Is the representation of a plane in terms of its normal vector and a point on the plane unique? That is, can two different equations encode the same plane?

- How do you determine the lines of intersection between two planes? The point of intersection between a line and a plane?

- Given a plane and a point not on the plane, how do you compute the perpendicular distance from the point to the plane?

- How can you tell when two planes are perpendicular?