**Math 241 Section 11.2: Vectors**
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1. Definition of a vector:

   Defined a vector as a triple $(a, b, c)$ or pair $(a, b)$ of points. The notation is confusing because it looks like a point. We have notations $(a, b, c)$, $[a\,b\,c]$, $\langle a, b, c \rangle$ and the one we'll use, $a\,\mathbf{i} + b\,\mathbf{j} + c\,\mathbf{k}$. I mentioned that what's really going on is $\mathbf{i} = (1, 0, 0)$, $\mathbf{j} = (0, 1, 0)$ and $\mathbf{k} = (0, 0, 1)$ and we're taking combinations.

2. Define $+$, $-$ and scalar multiple for vectors.

3. Visualization and Application:

   Vectors can be visualized as arrows pointing in space. The specific location where the arrow is anchored is not relevant but sometimes we'll anchor our vectors somewhere specific (like the origin, or at an object) if we need to.
   Show: Pictures to illustrate.

   I mentioned how we might anchor a vector at the origin if we're using it to point to an object and we might anchor it at an object if we're using it to point in the direction that the object is moving, for example.

4. Definitions/Properties:

   (a) Zero vector $\mathbf{0}$.

   (b) The vector $\overrightarrow{PQ}$ pointing from $P$ to $Q$. We get this by "subtracting $Q$ from $P$").

   (c) If $\mathbf{v} = a\,\mathbf{i} + b\,\mathbf{j} + c\,\mathbf{k}$ then the length (magnitude, norm) is $||\mathbf{v}|| = \sqrt{a^2 + b^2 + c^2}$.

   (d) A unit vector has length 1.

   (e) The unit vector in the direction of $\mathbf{v}$ is $\frac{\mathbf{v}}{||\mathbf{v}||}$.

   (f) Parallel vectors are vectors which are multiples of one another.

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NOTE: Problems like 27 and 28 on the homework can be a bit confusing at first. Basically if you know the angle of the vector you can use this (along with sine and cosine) to find the components.