HW 6, MA 1023
Due 3/2

1. 1) Sketch the region bounded by the polar curve $r = -4\cos\theta$ and $\frac{3\pi}{4} \leq \theta \leq \frac{5\pi}{4}$.
2) Find the area of the above region.

In exercise 2-3, find the length of the polar curves.
2.
$$r = \theta^2 \qquad 0 \leq \theta \leq \sqrt{5}$$

3.
$$r = 2 + 2\cos(\theta) \qquad 0 \leq \theta \leq \pi$$

4. Graph the points in the xyz-coordinate system satisfying the the given equations or inequalities.
1) $x^2 + y^2 = 4$ and $z = -2$.
2) $x^2 + y^2 + z^2 = 3$ and $z = 1$.

5. Find the component form and length of the vector with initial point $P(1, -2, 3)$ and terminal point $Q(-5, 2, 2)$.

6. Give $\vec{u} = \langle 3, -2, 1 \rangle$, $\vec{v} = \langle 2, -4, -3 \rangle$, $\vec{w} = \langle -1, 2, 2 \rangle$, find the magnitude of

(1) $\vec{u} + \vec{v} + \vec{w}$;

(2) $2\vec{u} - 3\vec{v} - 5\vec{w}$.

7. Find a unit vector parallel to the sum of $\vec{u} = 2\vec{i} + 4\vec{j} - 5\vec{k}$ and $\vec{v} = \vec{i} + 2\vec{j} + 3\vec{k}$.

8. Determine the value of x so that $\vec{u} = \langle 2, x, 1 \rangle$ and $\vec{v} = \langle 4, -2, -2 \rangle$ are perpendicular.