MAT 175 HOMEWORK #2

DUE FEBRUARY 22 (WEDNESDAY)

Note: *Please* **staple** *if necessary. Numbering of problems is as in the course textbook.*

(10.8.**3**) Name the conic that has the given equation, find its vertices, and sketch its graph:

$$9x^2 + 4y^2 - 36 = 0$$

(10.8.**6**) Name the conic that has the given equation, find its vertices, and sketch its graph:

$$x^2 - 4y^2 - 16 = 0$$

(10.8.**8**) Name the conic that has the given equation, find its vertices, and sketch its graph:

$$9x^2 + 9y^2 - 225 = 0$$

(11.1.**6**) Show that $(4, 5, 3)$, $(1, 7, 4)$, and $(2, 4, 6)$ are the vertices of an equilateral triangle.

(11.1.**12**) Find the equation of the sphere whose center is $(2, 4, 5)$ and that is tangent to the xy-plane.

(11.1.**18**) Sketch the graph of the given equation. Begin by sketching the traces in the coordinate planes.

$$3x - 4y + 2z = 24$$

(11.1.**22**) Sketch the graph of the given equation. Begin by sketching the traces in the coordinate planes.

$$3x + 4z = 12$$

(11.1.**37**) Find the equation of the sphere that has the line segment joining $(-2, 3, 6)$ and $(4, -1, 5)$ as a diameter.

(11.2.**2**) Draw the vectors $\vec{u} = \langle 2, 0 \rangle$, $\vec{v} = \langle 1, 1 \rangle$ and $\vec{w} = 2\vec{u} - 3\vec{v}$.

(11.2.**14**) Let $\vec{u} = \langle 0, 0, 0 \rangle$ and $\vec{v} = \langle -3, 3, 1 \rangle$. Find the sum $\vec{u} + \vec{v}$, the difference $\vec{u} - \vec{v}$, the magnitudes $\| \vec{u} \|$, $\| \vec{v} \|$, and a unit vector in the direction of $\vec{v}$.