Math 1152, Quiz #9, Spring 2014   Name _____ KEY _____

Instructions: Show all work. Use *exact* answers unless specifically asked to round. You may check your answers in the calculator, but you must show work to receive credit.

1. Find the parametric expression for an ellipse centered at the origin with a horizontal major axis of length 10 and a vertical minor axis of length 6.

$$2a = 10$$
$$a = 5$$

y-dir. $2b = 6$
        $b = 3$

x-direction

$$X = 5\cos t$$
$$Y = 3\sin t$$

2. Find the vector connecting the points $(2, -5)$ and $(-3, 1)$. Then find the length of the vector.

$$\vec{v} = \langle -5, 6 \rangle$$

$$\|\vec{v}\| = \sqrt{25 + 36} \qquad = \sqrt{61}$$

3. For the vectors $\vec{u} = \langle 2, -1 \rangle$ and $\vec{v} = 9\hat{i} + 2\hat{j}$, find the angle between them. Report your answer in radians rounded to 4 decimal places. What is the equivalent angle in degrees (with one decimal place)?

$$\cos\theta = \frac{\vec{u} \cdot \vec{v}}{\|\vec{u}\| \|\vec{v}\|} = \frac{18 - 2}{\sqrt{5}\sqrt{85}} = \frac{16}{\sqrt{425}}$$

$$\theta = \cos^{-1}\left(\frac{16}{\sqrt{425}}\right) \approx .6823 \text{ radians}$$

$$\approx 39.1°$$