MATH 171 **Paper&Pencil Homework 1** NAME_____

Due Tuesday 02/14/17 at the beginning of class.

Directions:

- Print out this file and write your solutions in the space provided.YOUR WORK MUST BE NEAT, EASY TO FOLLOW. Show all you work and box your final answer.
- You may use notes and textbook, but not the help of anything else.
- Each problem worth 10 points.

On my honor, as an Aggie, I certify that the solution submitted by me is my own work. I had neither given nor received unauthorized aid on this work.

Signature: _____

1. Find two unit vectors parallel to $\mathbf{a} = \langle 6, -8 \rangle$.

2. Find x if $\mathbf{u} = \frac{1}{3}\mathbf{i} + x\mathbf{j}$ is a unit vector.

3. Find all values of z such that $\mathbf{w} = \left\langle z, -\frac{z}{3} \right\rangle$ is a unit vector.

4. For the points $A(3, 4)$, $B(6, 10)$, $C(a + 2, b + 5)$, and $D(b + 4, a - 2)$, find the values of a and b such that $\vec{AB} = \vec{CD}$.

5. Let $\mathbf{u} = \langle 2, -3 \rangle$ and $\mathbf{v} = \langle -4, 1 \rangle$. Find vector $\mathbf{x} = \langle a, b \rangle$ such that $2\mathbf{x} + \mathbf{u} = \mathbf{v}$.

6. Find position vector of your final location if you start at the origin and walk along $\langle 4, -6 \rangle$ followed by $\langle 5, 9 \rangle$.

7. Let $\mathbf{a} = \langle x, 5 \rangle$ and $\mathbf{b} = \langle 2, 6 \rangle$.

   (a) Find the values of x such that $\mathbf{a}$ and $\mathbf{b}$ are parallel.

   (b) Find the values of x such that $\mathbf{a}$ and $\mathbf{b}$ are orthogonal.

8. Find the parametric equations for the line through the point $(5, 1)$ and parallel to $\mathbf{r}(t) = \langle -3 + t, 4 - t \rangle$.

9. Find the parametric equations for the line through the point $(5, 1)$ and perpendicular to $\mathbf{r}(t) = \langle -3, 4 - t \rangle$.

10. Eliminate the parameter to find the Cartesian equation of the curve $\mathbf{r}(t) = \langle 1 + \cos t, 2 + \sin t \rangle$, $\pi \leq t \leq 2\pi$. Then sketch the curve indicating the direction of motion.