**MATH 2574 (Calculus III)**
**Fri 27 Jan 2017**

# In-Class Quiz 1:
# Vectors and vector-valued functions (§11.1-11.6)

**Directions:** This quiz is due at the end of lecture.

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1. **(3 pts)** A block weighing $w$ pounds rests on a ramp with an incline of 30 degrees. If $\mathbf{F}$ is the gravitational force on the block then use the projection formula to find its normal component.

2. **(1 pt)** If $\mathbf{u}$ and $\mathbf{v}$ form two adjacent sides of a parallelogram, then the area of the parallelogram is:

3. **(3 pts)** Suppose $\mathbf{r}(t) = \langle x_0, y_0, z_0 \rangle + t\langle a, b, c \rangle$ is the equation of the line $\ell$ passing through the point $(x_0, y_0, z_0)$ and parallel to the vector $\langle a, b, c \rangle$. What is the equation of the projection of $\ell$ into the $zx$-plane?

4. **(1 pt)** A vector-valued function $\mathbf{r}(t)$ is continuous at $t = a$ provided that

$$\lim_{t \to a} \mathbf{r}(t) =$$

5. **(2 pts)** Let $\mathbf{r}(t) = \langle 1, 2t, 3t^2 \rangle$. Compute $\int \mathbf{r}(t)\, dt$.