Math 54 Quiz 4
February 20, 2014

This quiz will be graded out of 20 points. Read each problem carefully and show your work.

1. (10 points) (a) Find the area of the parallelogram whose vertices are at the points $(0, 0)$, $(5, 2)$, $(6, 4)$, and $(11, 6)$.

   (b) Find a 2×2 matrix A such that the linear transformation $T(\mathbf{x}) := A\mathbf{x}$ maps the above parallelogram to the unit square with vertices $(0, 0)$, $(1, 0)$, $(1, 0)$, and $(1, 1)$.

2. (10 points) Determine if the following sets are a subspace of the space $\mathbb{P}_2$ of polynomials of degree at most 2. Justify your answers.
(a) The set of polynomials of the form $p(t) = at^2$ for a a real number.

(b) The set of polynomials $p(t) = at^2 + bt + c$ with a, b, c real numbers, such that $p(0) = 1$.