

## QUIZ #16, 10/18/07

MATH 54, FALL 2007

*Show your work and justify your answers! Feel free to use both sides.*

**Name:**

1. Consider the inner product  $\langle f, g \rangle = \frac{1}{\pi} \int_{-\pi}^{\pi} f(x)g(x) dx$  (on the linear space of continuous functions on  $[-\pi, \pi]$ ).

(a) (3 pts) Find an orthonormal basis for  $P_1 = \text{span}(1, x)$ .

(b) (3 pts) Find the projection of  $\cos x$  (i.e. the function  $f(x) = \cos x$ ) to  $P_1$ .

2. (4 pts) Find the determinant of  $\begin{bmatrix} 1 & -1 & 1 \\ 4 & 1 & 3 \\ 3 & 2 & 0 \end{bmatrix}$ .