

Name: _____

Quiz 9a

Math 2250, Fall 2015

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1. Let $L : P_2 \rightarrow P_2$ be $L(p(x)) = p(x) - p(0)$. Compute $\text{Nul}(L)$ and $\text{Im}(L)$. (Write them as Span of a set of polynomials. You may assume that L is linear.)
(HINT: Write $p(x) = ax^2 + bx + c$ to do the calculation.)
2. Let $E : P_2 \rightarrow \mathbf{R}$ be the error in the trapezoidal approximation to $\int_{-1}^1 p(t)dt$:

$$E(p(x)) = \int_{-1}^1 p(t)dt - (p(1) + p(-1))$$

Compute $\text{Nul}(E)$. (Extra credit: Do this for P_3 rather than P_2 .)