Quiz 9
Math 2250, Fall 2015   **November 11, 2015**   **R. Bruner**

1. Let $L : P_2 \longrightarrow P_2$ be $L(p(x)) = p(x) - xp'(x)$. 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 $E : P_2 \longrightarrow \mathbf{R}$ be the error in the trapezoidal approximation to $\int_{-1}^{1} p(t)dt$:

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

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