

## Quiz #7

1. Show that the linear operator  $D^2 - 4D + 4I$  is 1-1 on  $P_2(x)$ .
2. Let  $\mathcal{B} = \{1, x + 1, x^2 + 1\}$  be a basis for  $P_2(x)$ .
  - (a) Find the change of basis matrix from  $\mathcal{B}$  to the standard basis  $\{1, x, x^2\}$ .
  - (b) If  $p(x) = 4 + 2x + x^2$ , find  $[p]_{\mathcal{B}}$ .
3. Let  $L(p) = p'' - 4p' + 4p$ , just as above, and let  $\mathcal{E}$  be the standard basis for  $P_2(x)$ . Find the matrix of  $L$  with respect to the basis  $\mathcal{E}$ :  ${}_{\mathcal{E}}[L]_{\mathcal{E}}$ .