

## Worksheet 7

**Due: Thursday, October 9**

Remember, where appropriate, explain how you got your answers! No calculators are allowed or needed.

1. Determine if the list  $\ln x, \ln x^2$  is linearly dependent or independent.
2. Write  $(-1, 8, 8)$  in terms of the vectors  $(1, 1, 1)$  and  $(2, -1, -1)$ .
3. Show that in  $L^2[0, 1]$ ,  $x^2 - 2x + 1$  and  $5x^2 + 2x - 1$  are orthogonal.
4. In  $L^2[0, 1]$ , we have

$$-15x^2 - 12x + 6 = c_1(x^2 - 2x + 1) + c_2(5x^2 + 2x - 1).$$

Find  $c_1$  and  $c_2$ .