

Deadline: 12N, Friday, 12 April

### Writing

- Using *clear sentences*, incorporate symbols, calculations, and, above all, illustrations into the text. Have an audience in mind. *Explain* what you're doing and why you're doing it—that is, provide an *concise* and *coherent* arguments for what you're doing. You can collaborate with a partner—submit one group paper.
- *Ethic*: You may consult classmates and the instructor, but what you write should be *entirely your own work*.
- Typed work is appreciated. Hand-drawn figures are acceptable.

### Reading

7.2-7.4, 7.7-7.10, 8.1-8.6

### Exercises

- 1) Recall that a basis of a vector space  $V$  is a set of linearly independent vectors that span  $V$ . This means that every element of  $V$  can be expressed as *finite* linear combination of basis vectors.
  - a) Determine a basis for the space of polynomials  $\mathbf{C}[x]$  over  $\mathbf{C}$  and thereby show that it's infinite-dimensional.
  - b) Show that the set  $C[0, 1]$  of continuous functions on  $[0, 1]$  is infinite-dimensional. Does it have a basis?
- 2) **7.2:** 2, 5
- 3) **7.3:** 3
- 4) **7.4:** 4
- 5) **7.7:** 5, 6
- 6) **7.8:** 2, 3
- 7) **7.9:** 1
- 8) **7.10:** 1
- 9) **8.3:** 1
- 10) **8.6:** 1