

## Calculus A(1): Homework 2

The total is 100 points. The bonus exercises are optional. We may (or may not) decide to grade one of your bonus exercises and use it to replace one assigned exercise (if it improves your total grade). We refer to Thomas' Calculus book (whose PDF is available on the weblearn) for the exercises given by a paragraph and number. If you are using your own Thomas' Calculus book, make sure that the numbering of exercises is identical with the PDF.

### Routine exercises (do not hand-in)

§1.2, Exercises 44, 47, 49, 61, 66

§1.4, Exercises 5, 7, 10, 11, 28

§1.5, Exercises 3, 5 (f), 6 (g), 7 (f), 9, 17, 39, 48, 49

§1.6, Exercises 13, 16, 54

### Assigned exercises (hand-in)

§1.5, Exercises 50 (20 points), 69 (5 pts), 79 (10 pts), 80 (10 pts)

§1.6, Exercises 49 (5 pts), 53 (15 pts)

A1 (15 pts). Find all  $x \in \mathbb{R}$  such that  $\cos(3x) = \sin(2x)$ .

A2 (20 pts). Let  $f : [0, 2] \rightarrow \mathbb{R}$  be such that the following two conditions hold:

1.  $\forall x \in [0, 1], f(x+1) = f(x) + 2$
2.  $\forall x \in [0, 1], f(x) = 2x$

Find a formula for  $f(x)$ .

### Bonus exercises (optional)

§1.6, Exercise 57

B1. Use Exercise A1 above to compute  $\cos(\frac{\pi}{5})$  (Hint: you may express  $\cos(3x)$  as a polynomial of degree 3 in  $\cos(x)$ .)