Queen Mary
University of London

MTH4100 Calculus 1, Autumn 2012

Exercise sheet 10

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All problems are similar to previous exam questions (but tables of standard integrals and hints on which method of integration to use are not given in the exam).

1. **Making a simplifying substitution.** Evaluate

$$\int_0^{\sqrt{\ln 2}} 2xe^{x^2}\,dx\ .$$

2. **Completing the square.** Evaluate

$$\int \frac{d\theta}{\sqrt{2\theta-\theta^2}}\ .$$

3. **Using integration by parts, and/or trigonometric identities.** Evaluate

$$\int \cos^2 x\,dx\ .$$

4. **Eliminating a square root.** Evaluate

$$\int_{-\pi}^{0} \sqrt{1-\cos^2\theta}\,d\theta\ .$$

5. **Reducing an improper fraction.** Evaluate

$$\int_{\sqrt{2}}^{3} \frac{2x^3}{x^2-1}dx\ .$$

6. **Separating a fraction.** Evaluate

$$\int \frac{1-x}{\sqrt{1-x^2}}dx\ .$$

7. **Multiplying by 1.** Evaluate

$$\int \frac{1}{1+\sin x}dx\ .$$