MAS115 Calculus I 2007-2008

Problem sheet for exercise class 9

- **Make sure you attend the excercise class that you have been assigned to!**

- Try to work on the problems first on your own. If you are stuck, ask for hints.

- The instructor and helper will be available for questions.

- Solutions will be available online by Friday.

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

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

Problem 2: **Completing the square.** Evaluate

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

Problem 3: **Using a trigonometric identity.** Evaluate

$$\int (\sin 3x \cos 2x - \cos 3x \sin 2x) dx \ .$$

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

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

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

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

Problem 6: **Separating a fraction.** Evaluate

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

Problem 7: **Multiplying by 1.** Evaluate

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

Prize Question: **The best correct solution submitted to me on or before December 10 will be rewarded with a cash prize.** Evaluate

$$\int_0^1 \frac{x}{\sqrt{2\pi\alpha^3(1-\alpha)}} \exp\left(-\frac{x^2}{2\alpha(1-\alpha)}\right) d\alpha \ .$$

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