MTH4100   **Calculus 1, Autumn 2008**

Exercise sheet 10   **Rainer Klages**

[all problems analogous to 2007/2008 exam questions, except that no tables will be needed]

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

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

2. **Completing the square.** Evaluate

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

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

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

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

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

8. **Happy Christmas Break!**