

All problems are analogous to 2007 - 2009 exam questions, except that for the exam no tables will be allowed, nor will they be needed.

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

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

8. **Happy Christmas Break!**