

10360 Integration Quiz - 45 mins - No Calculators Allowed.

1. Perform the following integration.

1a. $\int (2x^e + 3e^x - 8) dx$

1b. $\int \left(\cos(x) + \frac{1}{\cos^2(x)} \right) dx$

1c. $\int \tan(2x) dx$

1d. $\int 4x\sqrt{2x-3} dx$

2. Applying the substitution with $u = e^{2x} + 2$ to evaluate the integral $\int_0^1 \frac{e^{2x}}{1 + (e^{2x} + 2)^4} dx$ gives the following integral in variable u :

$$\int_a^b g(u) du$$

Find the function $g(u)$ and the values of a and b .

3. Evaluate the integral $\int_0^{\pi/3} \sin(2x) dx$. Give exact numerical answers with no trigonometric functions involved.

4. The area between the curve $y = x^2 - c$ and the x -axis is 36 sq. units. Find the value of c .

5. The **slope** of the function $f(x)$ is given by

$$f'(x) = x^2(2x + 3).$$

If the graph of $f(x)$ passes through the point $(1, -1)$, find a formula for $f(x)$.