Pearson Edexcel

A Level Mathematics 9MA0

Unit Test

10 Integration – 1

Time allowed: 50 minutes

School:

Name:

Teacher:

Question	Points	Score
1	6	
2	8	
3	3	
4	5	
5	5	
6	6	
7	4	
8	4	
9	9	
Total:	50	

1.

$$f(x) = \frac{6}{x} + \frac{3}{x^2} - 7x^{\frac{5}{2}}$$

(a) Find $\int f(x)\,\mathrm{d}x$.   [3]

(b) Evaluate $\int_4^9 f(x)\,\mathrm{d}x$, giving your answer in the form $m + n\ln(p)$, where m, n and p are   [3]

rational numbers.

Total: 6

2. Given that   [8]

$$\int_{\ln(2)}^{\ln(b)} \frac{\mathrm{e}^{2x}}{\mathrm{e}^{2x} - 1}\,\mathrm{d}x = \ln(4)$$

find the value of b showing each step in your working.

3. Showing all steps, find   [3]

$$\int \cot(3x)\,\mathrm{d}x$$

4. Find   [5]

$$\int \cos^2(6x)\,\mathrm{d}x$$

5. Given that   [5]

$$\int_a^4 (10 - 2x)\,\mathrm{d}x = \frac{211}{10}$$

find the value of a.

6. (a) Show that   [3]

$$\cos(7x) + \cos(3x) = 2\cos(5x)\cos(2x)$$

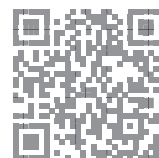by expanding $\cos(5x + 2x)$ and $\cos(5x - 2x)$ using the compound-angle formulae.

(b) Hence find   [3]

$$\int \cos(5x)\cos(2x)\,\mathrm{d}x$$

Total: 6

7. Find   [4]

$$\int_{\frac{\pi}{12}}^{\frac{\pi}{8}} \sin(4x)(1 - \cos(4x))^3\,\mathrm{d}x$$

8. Find [4]
$$\int \sin^3(x)\,\mathrm{d}x$$

9. (a) Show that [4]
$$\tan^4(x) \equiv \sec^2(x)\tan^2(x) + 1 - \sec^2(x)$$

    (b) Hence find the exact value of [5]
$$\int_0^{\frac{\pi}{4}} \tan^4(x)\,\mathrm{d}x$$

Total: 9