

# A

Test3/MATH1011/22-23/1st

THE UNIVERSITY OF HONG KONG  
DEPARTMENT OF MATHEMATICS

MATH1011 Test 3

- Name: \_\_\_\_\_ University number: \_\_\_\_\_
- Answer all questions.
- Use a blue or black pen for handwritten answers; avoid other colours. Don't use pencil.
- Write your answer in the space provided.
- No books and notes are allowed to use.
- Time allowed: 40 min

1. Find the indefinite integral. Each question carries 2 marks.

$$(a) \int \frac{9x^2 + 15}{x^3 + 5x} dx.$$

$$(b) \int x(3x - 1)^{2022} dx.$$

$$(c) \int x^2 e^{2x} dx.$$

$$(d) \int x^2 \ln(2x) dx.$$

$$(e) \int \frac{8x^2 + 13x + 6}{6x^3 + 19x^2 + 16x + 4} dx.$$

(f)  $\int \frac{dx}{x \ln x}.$

2. Find the area of the region enclosed by the following curves:  $y = x^2$ ,  $y = x + 6$ ,  $x = 0$  and  $x = 5$ . (3 marks)

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