

# 11. Integration

Name:	Class:	Date:
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1) Evaluate the following definite integral [3]

a)  $\int_0^2 (3x^2 - x + 2) dx$

b)  $\int_1^2 \left(x^5 - \frac{2}{x^4}\right) dx$

c)  $\int_0^4 (5x^2 + \sqrt{x}) dx$

2) Find the area between the curve with equation  $y = f(x)$ , the  $x$ -axis and the lines  $x = a$  and  $x = b$  in the following

a)  $f(x) = 5x^2 + 4x - 3$ ;  $a = 0, b = 3$

b)  $f(x) = 2 + 3x - 5x^3$ ;  $a = 0, b = 1$

c)  $f(x) = 6x^2 - 2\sqrt{x}$ ;  $a = 0, b = 2$

3) Find the area of the finite region between the curve and the  $x$ -axis of the following [5]

a)  $y = (2 - x)(x + 6)$

b)  $y = x^2(x + 1)$

c)  $y = x(x - 2)$

d)  $y = x(x + 2)(x - 8)$

e)  $y = x^2(x - 2)$

4) Complete the table below and use the trapezium rule to estimate  $\int_3^5 \left(\frac{2}{x^4 + 5}\right) dx$ . [1]

$x$	3	3.5	4	4.5	5
$y$	0.023		0.008		0.003

5) Complete the table below and use the trapezium rule to estimate  $\int_2^4 (\sqrt{5x^3 + 1}) dx$ . [1]

$x$	2	2.4	2.8	3.2	3.6	4
$y$	6.403		10.524	12.839		17.916

6) Use the trapezium rule with 4 strips to estimate  $\int_2^5 \left(\frac{5}{x^4 + 1}\right) dx$ . [1]

## Solutions for the assessment 11. Integration

1) a) 10

b)  $9\frac{11}{12}$

c) 112

2) a) 54

b)  $2\frac{1}{4}$

c) 12.2287638337

3) a)  $85\frac{1}{3}$

b)  $\frac{1}{12}$

c)  $1\frac{1}{3}$

d) 524

e)  $1\frac{1}{3}$

4) Table values are 0.013 and 0.005 and trapezium rule estimate is 0.02

5) Table values are 8.374 and 15.306 and trapezium rule estimate is 23.681

6) The trapezium rule estimate is 0.214