Further Pure Maths: Integration and Definite Integrals: 10-minute Pack

EDEXCEL 4PM1 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Give exact answers and show your working. In an indefinite integral, C is an arbitrary constant. In a definite integral, evaluate F(b) - F(a); the constant cancels, so the answer has no arbitrary constant.

1 Find the indefinite integral of $7*x^2$ with respect to x.

(Total for Question 1 is 1 mark)

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2 Water enters a container at a rate of $2*t^2 + 3$ litres per minute, where t is time in minutes. The volume added between t = 1 and t = 3 is the definite integral, from t = 1 to t = 3, of $2*t^2 + 3$ dt. Find this volume, showing both endpoint values.

(Total for Question 2 is 4 marks)

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3 Find the indefinite integral of 9 with respect to x.

(Total for Question 3 is 1 mark)

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4 Find the indefinite integral of $5*x^4 - 3*x$ with respect to x.

(Total for Question 4 is 2 marks)

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Mark scheme · Further Pure Maths: Integration and Definite Integrals: 10-minute Pack

Question 1

$(7/3)*x^3 + C$, where C is an arbitrary constant; accept equivalent forms.	**B1**

Answer: $(7/3)*x^3 + C$

Question 2

Integrate the inflow rate. An antiderivative is $F(t) = (2/3)*t^3 + 3*t$.	**M1**
$F(3) = 27$ and $F(1) = 11/3$, using the displayed F. Accept consistent endpoint values from another antiderivative differing by a constant.	**A1**
Calculate $F(3) - F(1) = 27 - 11/3$.	**M1**
70/3 litres; accept equivalent exact forms.	**A1**

Answer: 70/3 litres

Question 3

$9*x + C$, where C is an arbitrary constant; accept equivalent forms.	**B1**

Answer: 9*x + C

Question 4

Raise each power by 1 and divide each coefficient by the new power.	**M1**
$x^5 - (3/2)*x^2 + C$; accept equivalent forms.	**A1**

Answer: $x^5 - (3/2)*x^2 + C$

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