HIGHER

5.1 Differentiation: Gradients and Turning Points: 10-minute Pack

Total Marks

EDEXCEL 4MA1 · Calculator allowed · about 10 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A curve has equation $y = -x^4 - x^2 + 4x + 6$.
Find the gradient of the curve at the point where $x = 1$.

(Total for Question 1 is 2 marks)

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2 A curve has equation $y = x^3 + 3x^2 - 5$.
Find the values of x for which y is increasing (the gradient is positive).

(Total for Question 2 is 4 marks)

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3 $y = x^5 + 4x^2$
Find dy/dx.

(Total for Question 3 is 2 marks)

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Mark scheme · 5.1 Differentiation: Gradients and Turning Points: 10-minute Pack

Question 1

$dy/dx = -4x^3 - 2x + 4$ found	**M1**
gradient = -2 cao, from substituting x = 1	**A1**

Answer: Gradient = -2

Question 2

$dy/dx = 3x^2 + 6x$	**M1**
solves dy/dx = 0 to get x = -2 and x = 0	**M1**
identifies the sign of dy/dx between and outside these roots (a positive x^2 coefficient)	**M1**
x < -2 or x > 0 cao	**A1**

Answer: x < -2 or x > 0

Question 3

differentiates at least two terms correctly, using $n\,x^{n-1}$	**M1**
$dy/dx = 5x^4 + 8x$ cao (a constant term differentiates to 0)	**A1**

Answer: $dy/dx = 5x^4 + 8x$

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