CHAPTER 1
Geometrical applications of differentiation

The sign of the derivative (1)

QUESTION 1 Determine whether $f'(2)$ is positive or negative:

a $f(x) = x^2 - 7x$

b $f(x) = x^3 - 7x + 5$

c $f(x) = 9 - 3x - x^2$

QUESTION 2 Determine whether the curve is increasing or decreasing at the given point:

a $y = x^4 - x^3$ at $(1, 0)$

b $y = 8x^2 + 11x - 4$ at $(-2, 6)$

c $y = -\frac{3}{x}$ at $(3, -1)$

QUESTION 3 For what values of x is the curve $y = f(x)$ increasing?

a $y = 7x + 4$

b $y = x^2 + 8x - 5$

c $y = 4x^3 - 1$

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QUESTION **1** For what value of x is the curve $y = f(x)$ decreasing?

a $y = x^2 - 6x + 1$ **b** $y = x^3 - 12x + 5$ **c** $y = 2x^3 + 3$

QUESTION **2** For the curve $y = f(x)$ indicate whether $f'(x)$ will be positive, negative or zero at each of the points:

a A _____

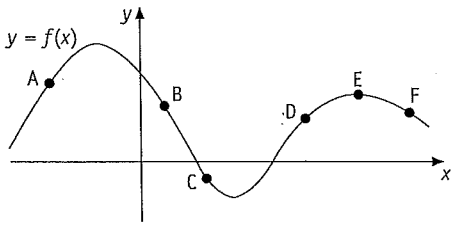
b B _____

c C _____

d D _____

e E _____

f F _____



QUESTION **3** Show that the curve:

a $y = 2x^3 + 6x - 2$ is always increasing **b** $y = x^5$ never decreases

Page 1 1 a negative b positive c negative 2 a increasing b decreasing c increasing 3 a all real values of x b $x > -4$ c all real values of x except $x = 0$

Page 2 1 a $x < 3$ b $-2 < x < 2$ c no values of x 2 a positive b negative c negative d positive e zero f negative