Geometrical applications of differentiation

Primitive functions (1)

QUESTION **1**   Find a primitive function of:

a x^2

b x^7

c $7x^5$

d $9x$

e $4x$

f $8x^3$

g x^{-2}

h $x^{\frac{1}{2}}$

QUESTION **2**   Find primitive functions of:

a $x^4 - x^3 + x$

b $2x^2 + 5x - 7$

c $x^6 + 3x^4$

d $x^2 - 8x + 3$

e $2x^3 + 7x^2 - 6x - 2$

f $5x^4 + 6x^3 - 9x + 4$

g $9x^5 + 16x^3 - 6x^2$

h $2x^7 - 3x^3 - 4x + 3$

i $x^8 + 6x^5 - 2x^3 - 4$

j $4\sqrt{x}$

k $\dfrac{1}{x^3}$

l $\dfrac{9x^8 - 5}{x^2}$

Geometrical applications of differentiation

Primitive functions (2)

QUESTION **1**   Find the curve $y = f(x)$ for which:

a $f'(x) = 2x - 2$ and $f(-1) = 6$

b $f'(x) = \dfrac{1}{2\sqrt{x}}$ and $f(4) = 2$

QUESTION **2**   A curve passes through the point (2, -1). Find the equation of the curve if:

a $\dfrac{dy}{dx} = 6x^2 - 10x$

b $\dfrac{dy}{dx} = 3 - \dfrac{1}{x^2}$

Page 26 1 **a** $\dfrac{x^3}{3}(+C)$ **b** $\dfrac{x^8}{8}(+C)$ **c** $\dfrac{7x^6}{6}(+C)$ **d** $\dfrac{9x^2}{2}(+C)$ **e** $2x^2(+C)$ **f** $2x^4(+C)$ **g** $-x^{-1}(+C)$ **h** $\dfrac{2x^{\frac{3}{2}}}{3}(+C)$

2 **a** $\dfrac{x^5}{5} - \dfrac{x^4}{4} + \dfrac{x^2}{2} + C$ **b** $\dfrac{2x^3}{3} + \dfrac{5x^2}{2} - 7x + C$ **c** $\dfrac{x^7}{7} + \dfrac{3x^5}{5} + C$ **d** $\dfrac{x^3}{3} - 4x^2 + 3x + C$ **e** $\dfrac{x^4}{2} + \dfrac{7x^3}{3} - 3x^2 - 2x + C$

f $x^5 + \dfrac{3x^4}{2} - \dfrac{9x^2}{2} + 4x + C$ **g** $\dfrac{3x^6}{2} + 4x^4 - 2x^3 + C$ **h** $\dfrac{x^8}{4} - \dfrac{3x^4}{4} - 2x^2 + 3x + C$ **i** $\dfrac{x^9}{9} + x^6 - \dfrac{x^4}{2} - 4x + C$ **j** $\dfrac{8x\sqrt{x}}{3} + C$

k $-\dfrac{1}{2x^2} + C$ **l** $\dfrac{9x^7}{7} + \dfrac{5}{x} + C$

Page 27 1 **a** $y = x^2 - 2x + 3$ **b** $y = \sqrt{x}$ 2 **a** $y = 2x^3 - 5x^2 + 3$ **b** $y = 3x + \dfrac{1}{x} - 7\dfrac{1}{2}$