WWW.M4THS.COM A LEVEL MATHS

(75) Integration (Finding c and Finding Functions)

WORKING AT D/E

(1) Acturve with equation y = f(x) passes through the point (1,2). Given that $\frac{dy}{dx} = 3x^2 + 4x - 7$, show that $y = x^3 + 2x^2 - 7x + 6$

(2) (a) Find $\int \left(\frac{4}{3}x^{\frac{1}{2}}\right) dx$

A curve with equation y = f(x) and passes through the point (9,12). (b) Given that $f'(x) = \frac{4}{2}x^{\frac{1}{2}}$ find f(x).

(3) The gradient function of $g(x) = \frac{2}{x^2}$ Given that the point (-0.25, 8) lies on the graph with equation y = g(x), find an expression for g(x)

WORKING AT B/C

(1) A curve has equation y = f(x)

Given that $\frac{dy}{dx} = 5x\sqrt{x}$ and that (1,3) is a point the curve, find an expression for f(x).

(2) A curve has equation y = f(x). The point (1,0) lies on the curve.

Given that $f'(x) = 1 - \frac{8}{x^3}$, find f(x) in the form $Ax^n + Bx + C$ where *A*, *B* and *C* are integers and *n* is a rational fraction.

(3) The gradient function of a curve is given as $\frac{dy}{dx} = 4x^2$

(a) Write down what type of equation the curve has.

(b) Given that the point (3, 35) lies on the curve, draw a sketch of the curve showing where the curve crosses the *y* axis.

WORKING AT A*/A

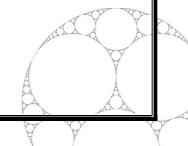
(1) Beryl has created a logo for her art project using a computer animation package. The area (A) of the onscreen logo she designs is such that the rate of change of the area with respect to time (t) is given as $-3t^2 + 6t + 4$

The animation appears on the screen from a dot and disappears 4 seconds later.

(a) Find an equation for the model in the form A = f(t)

(b) Find the area of the logo after one second.(c) Find when the logo is at its largest. Give your answer to 3 S.F.

(2) x = f(t), 0 < t < 5
(a) Given that f'(t) = ^{8t-1}/_{t³} and when t = 1, x = 4, find x when t = 2
(b) Write down the set of values for which f(t) is decreasing.
(c) Find the greatest value of f(t),



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