



FURTHER CALCULUS

CALCULATOR

1) Work out $\frac{dy}{dx}$ for each of the following.

a) $y = (2x + 5)^4$ b) $y = \sin(4x)$ c) $y = \frac{6}{(4 - x)^3}$ d) $y = \cos(4x) - (\sqrt{x})^5$

2) Evaluate each of the following.

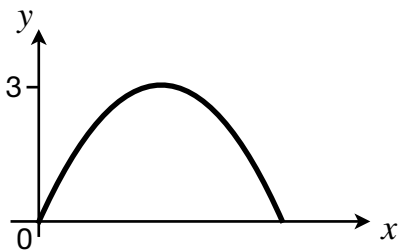
a) $\int 3 \sin(4x) dx$ b) $\int 2(3x - 5)^4 dx$ c) $\int_0^{\pi/4} 3 \cos(2x) dx$ d) $\int_2^3 (1 - 3x)^2 dx$

3) Solve the differential equation $\frac{dy}{dx} = 9x^2 - 4x + 3$ given that when $x = -2$, $y = 3$.

4) The gradient of the tangent to the curve at the point $(2, \pi)$ is given by $6 \cos(2x)$. Work out the equation of the curve.

5) The volume of a three dimensional solid is given by the formula $V = 24x - 8x^3$ where x is a length in centimetres. Find the value of x which maximises the volume and calculate the volume.

6) Part of the graph of $y = 3 \sin(2x)$ is shown below.



Calculate the area enclosed by the graph and the x -axis.