

1 Differentiate: (a) $y = 2x^3 - 3 \cos x$ (b) $y = (4 - 3x)^2$

2 Find $\int \sqrt{(1-3x)} dx$

3 Evaluate: (a) $\int_{-1}^0 (3x+2)^3 dx$ (b) $\int_0^{\frac{\pi}{2}} \sin 2x dx$

4 Determine $f'(x)$ when $f(x) = \frac{1}{(1-2x)^2} + \sin 3x$

5 Find the derivative of $\cos^2 x - \sin^2 x$ in two different ways.

6 If $f(x) = \cos(2x) - 3\sin(4x)$, find the exact value of $f'\left(\frac{\pi}{6}\right)$.

7 Calculate the area, in the first quadrant, bounded by the y-axis and the curves whose equations are $y = \cos x$ and $y = \sin x$. Give the answer as a surd in its simplest form.