

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

2 Find $\int \frac{4}{\sqrt{(1-2x)}} dx$

3 Evaluate: (a) $\int_{-1}^0 (2x-3)^3 dx$ (b) $\int_0^{\frac{\pi}{6}} \cos 2x dx$

4 Determine $f'(x)$ when $f(x) = \frac{1}{\sqrt[3]{(1-2x)^2}}$

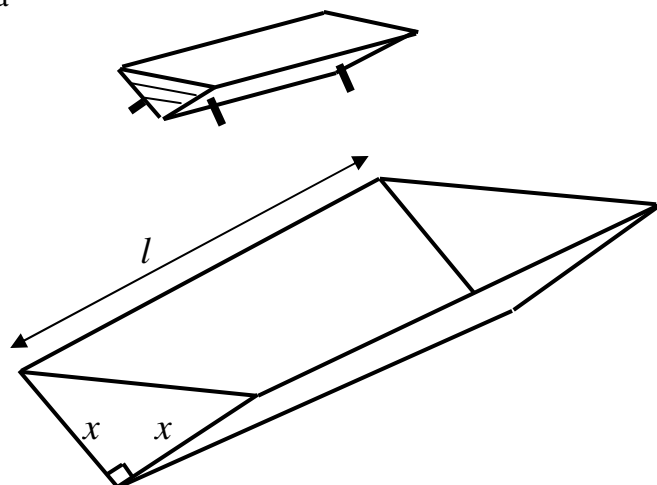
5 Find the derivative of $\cos 2x$ in two different ways.

6 An open top water tanker, in the shape of a triangular prism, has a capacity of 108 litres.

The tank is to be lined on the inside in order to make it watertight.

The triangular cross-section of the tank is right-angled and isosceles, with equal sides of length x cm.

The tank has length of l cm.



(a) Show that the surface area to be lined, A cm², is given by $A(x) = x^2 + \frac{432000}{x}$.

(b) Find the value of x which minimises this surface area.