

1. Find $f'(x)$, given that $f(x) = \frac{1}{\sqrt{x^3}} + \frac{3}{2\sqrt{x}}$

2. Differentiate the function $y = \sin 5x + 2\cos 4x$

3. A curve has equation $y = (x - 5)(x + 4)$.
Find the equation of the tangent to the curve at the point $x = 3$.

4. A log rolls down a hillside.
The distance, d metres, rolled after t seconds is given by
 $d(t) = 0.1t^3 + 0.5t$
 - a) Calculate the velocity (rate of change of distance) of the log after 2 seconds.
 - b) After how many seconds will the velocity of the log be 8m/s?

5. $f(x) = 5(7 - 2x)^3$. Find the value of $f'(4)$.