

SATPREP

Calculus

- Let $g(x) = \frac{\ln x}{x^2}$, for $x > 0$.
 - Use the quotient rule to show that $g'(x) = \frac{1 - 2 \ln x}{x^3}$.
 - The graph of g has a maximum point at A . Find the x -coordinate of A .
- Let $h(x) = \frac{6x}{\cos x}$. Find $h'(0)$.
- Let $f(x) = e^{-3x}$ and $g(x) = \sin x \cdot \frac{\pi}{3}$.
 - Write down
 - $f'(x)$;
 - $g'(x)$.
 - Let $h(x) = e^{-3x} \sin x \cdot \frac{\pi}{3}$. Find the exact value of $h' \left(\frac{\pi}{3} \right)$.
- A gradient function is given by $\frac{dy}{dx} = 10e^{2x} + 5$. When $x = 0$, $y = 8$. Find the value of y when $x = 1$.
- Let $g(x) = 2x \sin x$.
 - Find $g'(x)$.
 - Find the gradient of the graph of g at $x = \pi$.
- Let $f(x) = e^x \cos x$. Find the gradient of the normal to the curve of f at $x = \pi$.
- The graph of $y = \sqrt{x}$ between $x = 0$ and $x = a$ is rotated 360° about the x -axis. The volume of the solid formed is 32π . Find the value of a .