



Let f be a twice-differentiable function defined on the interval $-1.2 < x < 3.2$ with $f(1) = 2$. The graph of f' , the derivative of f , is shown above. The graph of f' crosses the x -axis at $x = -1$ and $x = 3$ and has a horizontal tangent at $x = 2$. Let g be the function given by $g(x) = e^{f(x)}$.

- Write an equation for the line tangent to the graph of g at $x = 1$.
- For $-1.2 < x < 3.2$, find all values of x at which g has a local maximum. Justify your answer.
- The second derivative of g is $g''(x) = e^{f(x)} \left[(f'(x))^2 + f''(x) \right]$. Is $g''(-1)$ positive, negative or zero? Justify your answer.
- Find the average rate of change of g' , the derivative of g , over the interval $[1, 3]$.