

MATH1003
QUIZ 5

This quiz has four questions, with each question worth 5 marks.

The quiz lasts for thirty minutes. No calculator, textbooks, or other notes are allowed.

1. Find the derivative of:

(i) $y = \frac{1 - \cosh x}{1 + \cosh x}$,

(ii) $y = \sinh \ln x$.

2. Use logarithmic differentiation to find the derivative of $y = (\sin x)^{\ln x}$.

3. (i) Find the critical numbers of $f(x) = x^4(x - 1)^3$.

(ii) What does the Second Derivative Test tell you about the behaviour of f at these critical numbers?

(iii) What does the First Derivative Test tell you?

4. Suppose f'' is continuous on $(-\infty, \infty)$.

(i) If $f'(2) = 0$ and $f''(2) = -5$, what can you say about f ?

(ii) If $f'(6) = 0$ and $f''(6) = 0$, what can you say about f ?