



QUESTION WORKBOOK

Differentiating trig, exponentials and logs

Differentiation · Year 12–13

7 questions · 20 marks

NAVY SCREEN EDITION

SECTION A · Warm-up

A1 Differentiate $y = \sin 2x$, and $y = \cos 3x$. [2]

A2 Differentiate $y = e^{5x}$, and $y = \ln x$. [2]

SECTION B · Standard

B1 Differentiate $y = 2 \sin 3x + 4 \cos 2x$. [3]

B2 Differentiate $y = 5 \ln x + \sin 2x$, and find the gradient at $x = \pi$ to 3 significant figures. [3]

- B3** Prove from first principles that the derivative of $\sin x$ is $\cos x$. You may use the small-angle limits for $\sin h$ and $\cos h$. [4]

- B4** Differentiate $y = e^{2x} - 4e^{-x}$, and find the gradient at $x = 0$. [3]

SECTION C · Stretch

- C1** Differentiate $y = \tan 3x$, and find the gradient where $x = 0$. [3]