

爱德思

Further Pure Mathematics 3

分类真题

2014-2022 册

A Level Clouds 出品

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Chapter 1

Hyperbolic Functions

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3. Using the definitions of $\sinh x$ and $\cosh x$ in terms of exponentials,

- (a) prove that

$$\cosh^2 x - \sinh^2 x \equiv 1$$

(2)

- (b) find algebraically the exact solutions of the equation

$$2 \sinh x + 7 \cosh x = 9$$

giving your answers as natural logarithms.

(5)

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1. Find the exact values of x for which

$$\cosh 2x - 7 \sinh x = 5$$

giving your answers as natural logarithms.

(7)

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1. Solve the equation

$$18 \cosh x + 14 \sinh x = 11 + e^x$$

Give your answers in the form $\ln a$, where a is rational.

(5)

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1. Solve the equation

$$15 \operatorname{sech}^2 x + 7 \tanh x = 13$$

Give your answers in terms of simplified natural logarithms.

(6)

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2. (a) Starting from the definitions of $\sinh x$ and $\cosh x$ in terms of exponentials, prove that
- (i) $\cosh 2x \equiv 2 \cosh^2 x - 1$
 - (ii) $\sinh 2x \equiv 2 \sinh x \cosh x$

(4)

- (b) Solve the equation

$$\cosh 2x - 7 \cosh x = -7$$

giving your answers as exact logarithms.

(5)