

**Hyperbolic functions – AS Further Mathematics P1**

1. June/2022/Paper\_7366/01/No.1

Which of the following exponential expressions is equivalent to  $2 \sinh x$  ?

Circle your answer.

**[1 mark]**

$e^x$

$e^x + e^{-x}$

$e^x - e^{-x}$

$e^{-x}$

2. June/2022/Paper\_7366/01/No.15

The two values of  $\theta$  that satisfy the equation

$$\sinh^2 \theta - \sinh \theta - 2 = 0$$

are  $\theta_1$  and  $\theta_2$ (a) Hamzah is asked to find the value of  $\theta_1 + \theta_2$ 

He writes his answer as follows:

The quadratic coefficients are  $a = 1$ ,  $b = -1$ ,  $c = -2$ The sum of the roots is  $-\frac{b}{a}$ 

$$\text{So } \theta_1 + \theta_2 = -\frac{-1}{1} = 1$$

Explain Hamzah's error.

**[1 mark]**


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