$a; b; c$ are real numbers and $a > b$, which of the following must be true?

(a) 1

Senior Questions.

1. Let $S(x) = \dfrac{e^x - e^{-x}}{2}$ and $C(x) = \dfrac{e^x + e^{-x}}{2}$.

   (a) Show that $(C(x))^2 - (S(x))^2 = 1$:

   (b) If $S(x) = \tan$, express $C(x)$ in terms of :

2. Find the integral

$$\int_{\frac{\pi}{4}}^{\frac{\pi}{2}} \frac{\cos^4}{\sin^2} d :$$

3. A die is thrown n times. Show that if the probability that a 6 appears at least once is greater than $\frac{1}{2}$, then $n > \dfrac{\log 2}{\log 6 - \log 5}$: