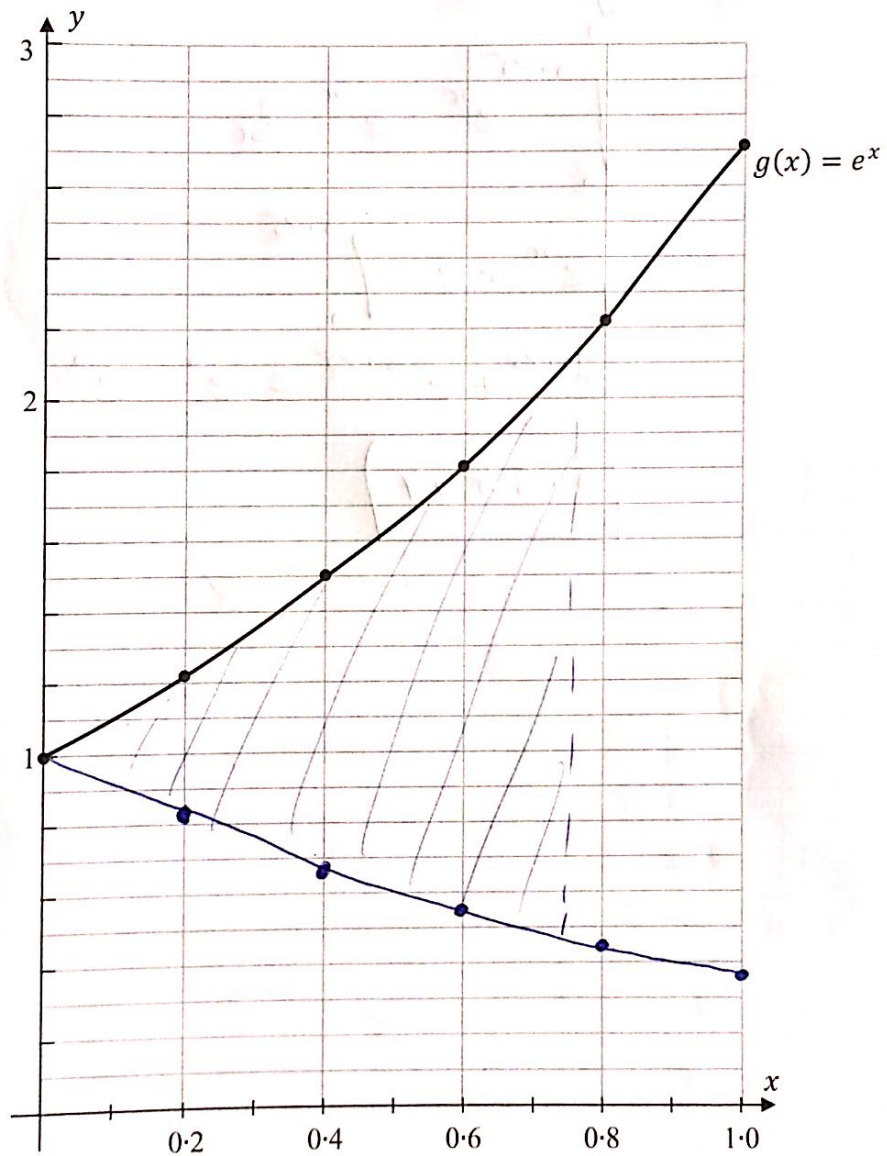


Question 6

(25 marks)

The graph of the function  $g(x) = e^x$ ,  $x \in \mathbb{R}$ ,  $0 \leq x \leq 1$ , is shown on the diagram below.

(a) On the same diagram, draw the graph of  $h(x) = e^{-x}$ ,  $x \in \mathbb{R}$ , in the domain  $0 \leq x \leq 1$ .



$x$	0	0.2	0.4	0.6	0.8	1
$f(x)$	1	0.82	0.67	0.55	0.45	0.37

- (b) Find the area enclosed by  $g(x) = e^x$ ,  $h(x) = e^{-x}$ , and the line  $x = 0.75$ .  
Give your answer correct to 4 decimal places.

$$\text{Area} = \int_0^{0.75} y_{\text{high}} - y_{\text{low}} dx$$

$$= \int_0^{0.75} e^x - e^{-x} dx$$

$$= \left[ e^x + e^{-x} \right]_0^{0.75}$$

$$= e^{0.75} + e^{-0.75} - e^0 - e^0$$

$$= \boxed{0.5894}$$