Question 8 (12 marks)

(a) The graph below represents a continuous probability density function defined for $0 \le x \le 4$. Let this probability density function be f(x) = a.



(i) Find the value of a.



(ii) (1) Write an integral expression for the mean (μ_X) of the distribution.

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(2) Evaluate your expression to determine the $\mu_{\rm X}$ of the distribution.



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(iii) Calculate the standard deviation ($\sigma_{\rm X}$) of the distribution. Give your answer correct to one decimal place.

(b) The graph below represents a different continuous probability density function defined for $0 \le x \le 4$. Let this probability density function be g(x).



(c) (i) Using the information from parts (a) and (b), state which distribution you would expect to have the larger standard deviation.

(1 mark)

(ii) Justify your answer.

(2 marks)