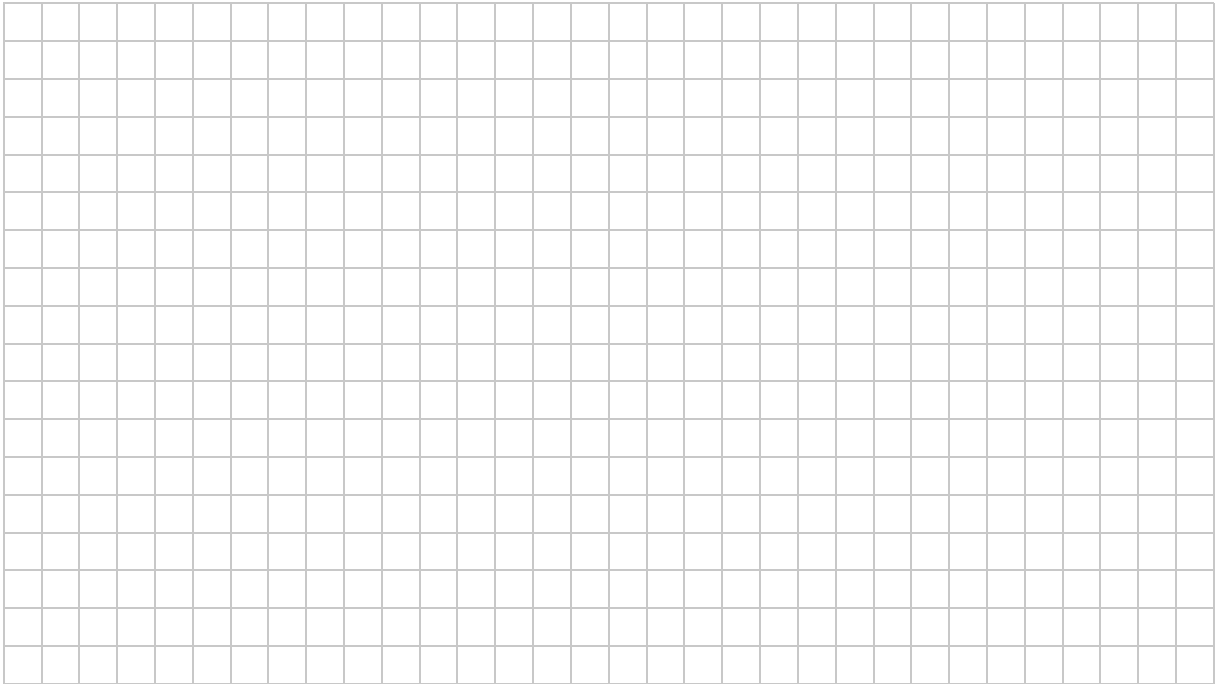


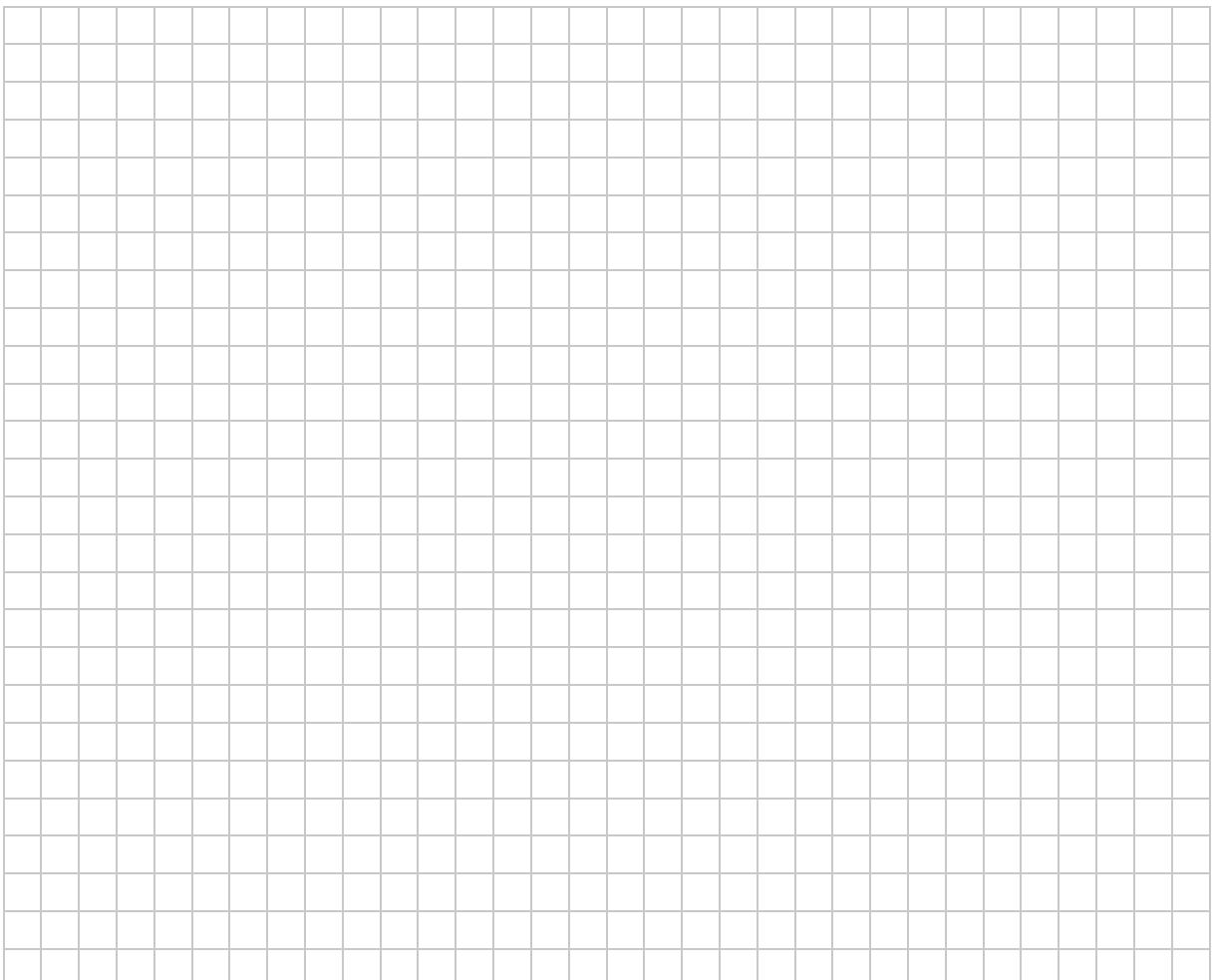
**Question 6**

**(25 marks)**

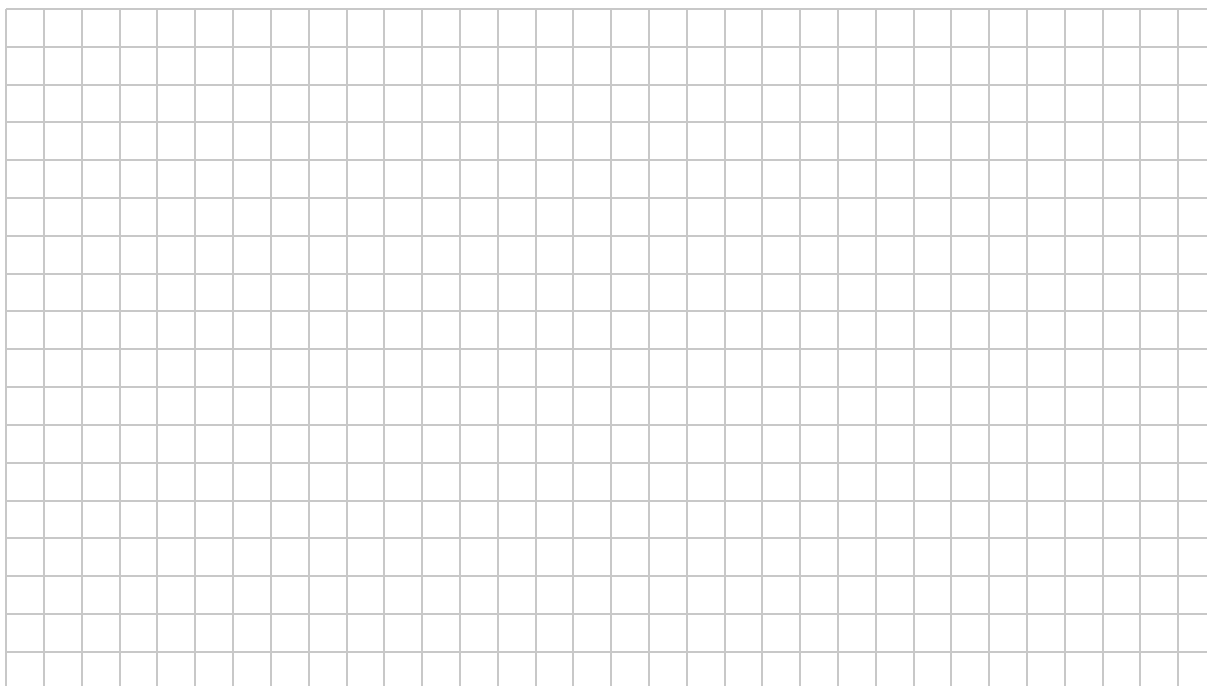
- (a) Differentiate the function  $(2x + 4)^2$  from first principles, with respect to  $x$ .



- (b) (i) If  $y = x \sin\left(\frac{1}{x}\right)$ , find  $\frac{dy}{dx}$ .



- (ii) Find the slope of the tangent to the curve  $y = x \sin \left( \frac{1}{x} \right)$ , when  $x = \frac{4}{\pi}$ .  
Give your answer correct to two decimal places.



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