Leave blank

5. The rectangular hyperbola H has equation $xy = 16$

The point P, on H, has coordinates $\left(4p, \frac{4}{p}\right)$ where p is a non-zero constant.

(a) Show, using calculus, that the tangent to H at the point P has equation

$$x + p^2y = 8p$$

(4)

Given that the tangent to H at the point P passes through the point (7, 1)

(b) use algebra to find the coordinates of the two possible positions of P.

(4)

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

Leave blank

Question 5 continued

Leave blank

Question 5 continued

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA
DO NOT WRITE IN THIS AREA

Leave blank

Question 5 continued

Q5

(Total 8 marks)