1. **In this question you must show all stages of your working.**
Solutions relying on calculator technology are not acceptable.

$$f(z) = 4z^3 - 5z^2 + 14z + 15$$

Given that $1 - 2i$ is a root of the equation $f(z) = 0$, determine the other two roots of the equation $f(z) = 0$

(5)

(Total for Question 1 is 5 marks)

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2. **In this question you must show all stages of your working.**
Solutions relying on calculator technology are not acceptable.

The rectangular hyperbola H has parametric equations

$$x = 6t \qquad y = \frac{6}{t} \qquad t \neq 0$$

The line l has equation $x - 3y + 3 = 0$

(a) Determine the coordinates of the points of intersection of H and l

(3)

Given that

- H and l intersect at the point P where $x < 0$
- the tangent to H at P intersects the x-axis at the point Q

(b) determine the x coordinate of Q

(3)

(Total for Question 2 is 6 marks)