Hyperbolas - Exercises (1 page; 18/8/19)

See also the separate note "Hyperbolas" for further exercises.

(1) Show that the equation of the tangent to the hyperbola $\frac{x^2}{a^2} - \frac{y^2}{b^2} = 1$ at the point $(acosht, bsinht)$ is

$yasinht = xbcosht - ab$

(2) Given that the tangent in (C)(1) meets the asymptotes of the hyperbola at the points P & Q, show that the mid-point of P & Q is $(acosht, bsinht)$.

(3) In the case where $b = a$, find the area of the triangle OPQ (where P & Q are as in (C)(2), and O is the Origin).

(4) The chord PQ, where P and Q are points on the rectangular hyperbola $xy = c^2$, has gradient 1. Show that the locus of the point of intersection of the tangents from P and Q is the line $y = -x$. [Edx FP3 textbook, Ex. 2G, Q9]