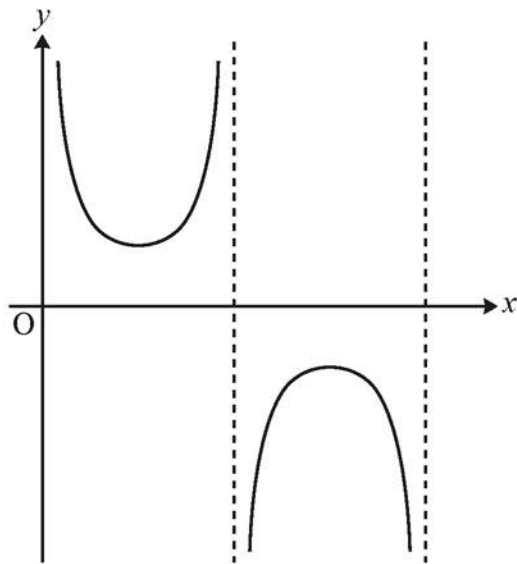


- 6 (a) The diagram shows part of the graph of $y = \operatorname{cosec} x$, where x is in radians.

State the equations of the **three** vertical asymptotes that can be seen.

[1]



The tangent to the graph at the point P with x -coordinate $\frac{\pi}{3}$ meets the x -axis at Q.

- (b) Show that the x -coordinate of Q is $\frac{\pi}{3} + \sqrt{3}$. (You may use without proof the result that the derivative of $\operatorname{cosec} x$ is $-\operatorname{cosec} x \cot x$.)

[6]