d. **i.** Show that for the roads of arbitrary widths a and b, the maximum length of pine which can be carried around the corner can be found by solving $a\sin^3(\theta) - b\cos^3(\theta) = 0$. 2 marks

ii. Hence, show that the maximum length of pine which can be carried around the corner of arbitrary roads of widths a and b is $\left(a^{\frac{2}{3}} + b^{\frac{2}{3}}\right)^{\frac{3}{2}}$. 3 marks

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