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3 **(a)** 3 men and 3 women are standing in a line.
The 3 men are standing next to each other.

Find how many different arrangements are possible. [2]

(b) In the 13-letter word MULTIBRANCHED, there are 4 vowels, U, I, A and E.

7 different letters are selected from these 13 letters.

Find how many different selections are possible if the selection includes at least 2 vowels. [3]

4 **(a)** Show that $\frac{1-\sin x}{\cos x}+\frac{\cos x}{1-\sin x}=2\sec x$. [3]

(b) Hence solve the equation $\frac{1-\sin\frac{\theta}{2}}{\cos\frac{\theta}{2}}+\frac{\cos\frac{\theta}{2}}{1-\sin\frac{\theta}{2}}=3$ for $0°\leqslant\theta\leqslant 720°$. [3]

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