4 The line $y = kx + 6$ intersects the curve $y = x^3 - 4x^2 + 3kx + 2$ at the point where $x = 2$.

(a) Find the value of k. [2]

(b) Show that, for this value of k, the line cuts the curve only once. [4]

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

(b) Hence solve the equation $\frac{\cos\frac{\theta}{2}}{1-\sin\frac{\theta}{2}}+\frac{1-\sin\frac{\theta}{2}}{\cos\frac{\theta}{2}}=8\cos^2\frac{\theta}{2}$ for $-360° < \theta < 360°$. [4]

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