Test - Further trigonometry

Year: Year 13 · Duration: 40 minutes · /20

Name:	Date:	**Mark:** /20

Question	1	2	3	4	5	Total
marks	4	4	4	4	4	**20**
Mark						

Show your working.

Question 1 (4 marks)

Question 1 – Small angles

(a) Use small-angle approximations to find an approximation for $\dfrac{\theta \tan 2\theta}{1-\cos 3\theta}$ when θ is small. [2 marks] (b) Evaluate the expression for $\theta = 0.1$ and find the percentage difference from your answer to part (a), to 2 significant figures. [2 marks]

Question 2 (4 marks)

Question 2 – A reciprocal equation

Solve $2\tan^2 x + \sec x = 1$ for $0^\circ \leq x$, giving answers to 1 decimal place. [4 marks]

Question 3 (4 marks)

Question 3 – Compound angles

(a) Find the exact value of $\sin 105^\circ$. [2 marks] (b) The angles A and B are acute with $\sin A = \dfrac{5}{13}$ and $\cos B = \dfrac{4}{5}$. Find the exact value of $\cos(A - B)$. [2 marks]

Question 4 (4 marks)

Question 4 – A double angle equation

Solve $2\cos 2x + 3\sin x = 1$ for $0^\circ \leq x$. [4 marks]

Question 5 (4 marks)

Question 5 – Combining sine and cosine

(a) Express $8\cos x + 15\sin x$ in the form $R\cos(x - \alpha)$ where $R > 0$ and 0°. [2 marks]
(b) Solve $8\cos x + 15\sin x = 10$ for $0^\circ \leq x$. [2 marks]