A#16 ADDITION FORMULAE

AEM questions are taken from past exam papers - they have been carefully chosen to represent a typical exam question at each level of difficulty. If you can do these questions, you’re ready to move onto past papers for this topic.

APPRENTICE

It is given that $\theta$ is the acute angle such that $\cot \theta = 4$.
Without using a calculator, find the exact value of $\tan(\theta + 45^\circ)$.

EXPERT

It is given that $\sin A = \frac{\sqrt{5}}{3}$ and $\sin B = \frac{1}{\sqrt{5}}$, where the angles $A$ and $B$ are both acute.

a. i. Show that the exact value of $\cos B = \frac{2}{\sqrt{5}}$.

ii. Hence show that the exact value of $\sin 2B$ is $\frac{4}{5}$.

b. i. Show that the exact value of $\sin(A - B)$ can be written as $p(5 - \sqrt{5})$, where $p$ is a rational number.

ii. Find the exact value of $\cos(A - B)$ in the form $r + s\sqrt{5}$, where $r$ and $s$ are rational numbers.

MASTER

It is given that $A$ and $B$ are angles such that $\sec^2 A - \tan A = 13$ and $\sin B \sec^2 B = 27 \cos B \cosec^2 B$.

Find the possible exact values of $\tan(A - B)$. 

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