

TRIGONOMETRY ADDITION FORMULAE

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PROVE the addition formula for $\tan(A+B)$ and $\cot(A+B)$. Show that $\cot(A+B)$ can be written $\frac{\cot(A)\cot(B)-1}{\cot(A)+\cot(B)}$

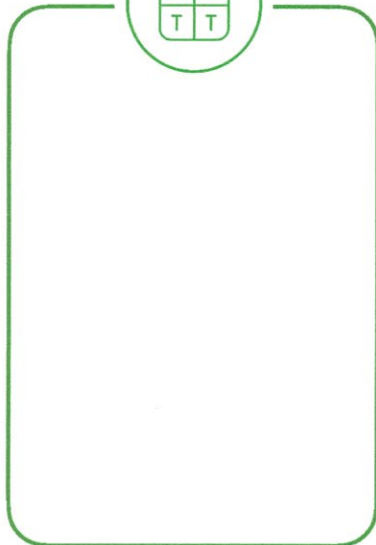
$$\sin(A+B) = \sin A \cos B + \sin B \cos A$$

$$\cos(A+B) = \cos A \cos B - \sin A \sin B$$

$$\tan(A+B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

Other formulae

- 3 pythagorean
- 3(+2) double / half angle formulae
- 2 half / double angle formulae



$$\tan(A+B) = \frac{\sin(A+B)}{\cos(A+B)}$$

$$= \frac{\sin A \cos B + \sin B \cos A}{\cos A \cos B - \sin A \sin B}$$

$$= \frac{\frac{\sin A}{\cos A} + \frac{\sin B}{\cos B}}{1 - \frac{\sin A \sin B}{\cos A \cos B}}$$

$$= \frac{\tan A + \tan B}{1 - (\tan A \tan B)}$$

$$= \frac{\tan A + \tan B}{1 - \tan A \tan B}$$

$$\cot(A+B)$$

$$= \frac{\cos(A+B)}{\sin(A+B)}$$

$$= \frac{\cos A \cos B - \sin A \sin B}{\sin A \cos B + \sin B \cos A}$$

