7.1) Addition formulae

Worked example	Your turn

Given that
$$sin(A + B) = sin\,A\,cos\,B + cos\,A\,sin\,B$$
find $\sin(A - B)$

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

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

Given that
$$\cos(A + B) = \cos A \cos B - \sin A \sin B$$
find $cos(A - B)$

Worked example	Your turn
Use the formulae for $\sin(A - B)$ and $\cos(A - B)$ to prove that $$\tan(A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$$	Use the formulae for $\sin(A + B)$ and $\cos(A + B)$ to prove that $$\tan(A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$$ Proof

Worked example	Your turn
Given that $3\sin(x-y) = 2\cos(x+y)$ express $\tan x$ in terms of $\tan y$.	Given that $2\sin(x+y) = 3\cos(x-y)$ express $\tan x$ in terms of $\tan y$.
	$$\tan x = \frac{3 - 2\tan y}{2 - 3\tan y}$$

Worked example	Your turn
Express the following as a single sine, cosine or tangent, and evaluate:	Express the following as a single sine, cosine or tangent, and evaluate:
$\sin 30° \cos 60° + \cos 30° \sin 60°$	$\sin 60° \cos 30° - \cos 60° \sin 30°$
	$\sin 30° = \dfrac{1}{2}$
$\cos 20° \cos 25° - \sin 20° \sin 25°$	$\cos 70° \cos 25° + \sin 70° \sin 25°$
	$\cos 45° = \dfrac{\sqrt{2}}{2}$
$\dfrac{\tan \dfrac{\pi}{18} + \tan \dfrac{\pi}{9}}{1 - \tan \dfrac{\pi}{18} \tan \dfrac{\pi}{9}}$	$\dfrac{\tan \dfrac{13\pi}{36} - \tan \dfrac{\pi}{9}}{1 + \tan \dfrac{13\pi}{36} \tan \dfrac{\pi}{9}}$
	$\tan \dfrac{\pi}{4} = 1$

Worked example	Your turn
Write in the form $\sin(x \pm \theta)$ or $\cos(x \pm \theta)$ where $0 < \theta < \frac{\pi}{2}$:	Write in the form $\sin(x \pm \theta)$ or $\cos(x \pm \theta)$ where $0 < \theta < \frac{\pi}{2}$:
$\frac{1}{2}(\sqrt{3}\sin x + \cos x)$	$\frac{1}{2}(\sin x - \sqrt{3}\cos x)$
	$\sin(x + \frac{\pi}{3})$
$\frac{1}{2}(\sqrt{3}\cos x - \sin x)$	

Worked example	Your turn
Given that $\tan(x + \frac{\pi}{6}) = \frac{1}{2}$ evaluate $\tan x$	Given that $\tan(x + \frac{\pi}{4}) = \frac{1}{2}$ evaluate $\tan x$
	$\tan x = -\frac{1}{3}$
Given that $\tan(x - \frac{\pi}{3}) = \frac{1}{2}$ evaluate $\tan x$	