Compound Angles

SINE

Investigation #1

(a) Evaluate $\sin\frac{\pi}{2}$

(b) Evaluate $\sin\frac{\pi}{3}\cos\frac{\pi}{6}+\cos\frac{\pi}{3}\sin\frac{\pi}{6}$

Investigation #2

(a) Evaluate $\sin\frac{\pi}{3}$

(b) Evaluate $\sin\frac{\pi}{2}\cos\frac{\pi}{6}-\cos\frac{\pi}{2}\sin\frac{\pi}{6}$

Addition Formula Sine: $\sin(a+b)=\sin a\cos b+\cos a\sin b$

Subtraction Formula Sine: $\sin(a-b)=\sin a\cos b-\cos a\sin b$

Example: Find the exact value of $\sin\frac{\pi}{12}$

COSINE

Investigation #3

(b) Evaluate $\cos\frac{\pi}{2}$

(b) Evaluate $\cos\frac{\pi}{3}\cos\frac{\pi}{6}-\sin\frac{\pi}{3}\sin\frac{\pi}{6}$

Investigation #4

(c) Evaluate $\cos\frac{\pi}{3}$

(b) Evaluate $\cos\frac{\pi}{2}\cos\frac{\pi}{6}+\sin\frac{\pi}{2}\sin\frac{\pi}{6}$

Addition Formula Cosine: $\cos(a+b)=\cos a\cos b-\sin a\sin b$

Subtraction Formula Cosine: $\cos(a-b)=\cos a\cos b+\sin a\sin b$

Example: Find the exact value of $\cos\frac{5\pi}{12}$

TANGENT

Addition Formula Tangent: $\tan(a+b)=\dfrac{\tan a+\tan b}{1-\tan a\tan b}$

Subtraction Formula Tangent: $\tan(a-b)=\dfrac{\tan a-\tan b}{1+\tan a\tan b}$

Example: Find the exact value of $\tan\frac{11\pi}{12}$

Final Example: If $\sin a=\frac{-4}{5}$, $\pi\le a\le\frac{3\pi}{2}$ and $\cos b=\frac{-5}{13}$, $\frac{\pi}{2}\le b\le\pi$ then evaluate $\tan(a+b)$.