

W2 – 4.4 Compound Angle Formulas

MHF4U

1) Use an appropriate compound angle formula to express as a single trig function, and then determine an exact value for each

a) $\sin \frac{\pi}{4} \cos \frac{\pi}{12} + \cos \frac{\pi}{4} \sin \frac{\pi}{12}$

b) $\sin \frac{\pi}{4} \cos \frac{\pi}{12} - \cos \frac{\pi}{4} \sin \frac{\pi}{12}$

c) $\cos \frac{\pi}{4} \cos \frac{\pi}{12} - \sin \frac{\pi}{4} \sin \frac{\pi}{12}$

d) $\cos \frac{\pi}{4} \cos \frac{\pi}{12} + \sin \frac{\pi}{4} \sin \frac{\pi}{12}$

e) $\cos \frac{2\pi}{9} \cos \frac{5\pi}{18} - \sin \frac{2\pi}{9} \sin \frac{5\pi}{18}$

f) $\cos \frac{10\pi}{9} \cos \frac{5\pi}{18} + \sin \frac{10\pi}{9} \sin \frac{5\pi}{18}$

3) Apply a compound angle formula, and then determine an exact value for each.

a) $\sin \left(\frac{\pi}{3} + \frac{\pi}{4} \right)$

b) $\cos \left(\frac{\pi}{3} + \frac{\pi}{4} \right)$

c) $\cos \left(\frac{2\pi}{3} - \frac{\pi}{4} \right)$

d) $\sin \left(\frac{2\pi}{3} - \frac{\pi}{4} \right)$

e) $\tan\left(\frac{\pi}{4} + \pi\right)$

f) $\tan\left(\frac{\pi}{3} - \frac{\pi}{6}\right)$

4) Use an appropriate compound angle formula to determine an exact value for each.

a) $\sin\frac{7\pi}{12}$

b) $\sin\frac{5\pi}{12}$

c) $\cos\frac{11\pi}{12}$

d) $\cos\frac{5\pi}{12}$

e) $\sin\frac{13\pi}{12}$

f) $\cos\frac{17\pi}{12}$

g) $\sin \frac{19\pi}{12}$

h) $\cos \frac{23\pi}{12}$

5) Angles x and y are located in the first quadrant such that $\sin x = \frac{3}{5}$ and $\cos y = \frac{5}{13}$. Determine exact values for $\cos x$ and $\sin y$.

6) Refer to the previous question. Determine an exact value for each of the following.

a) $\sin(x + y)$

b) $\sin(x - y)$

c) $\cos(x + y)$

d) $\cos(x - y)$

7) Use a compound angle formula to show that $\cos(2x) = \cos^2 x - \sin^2 x$