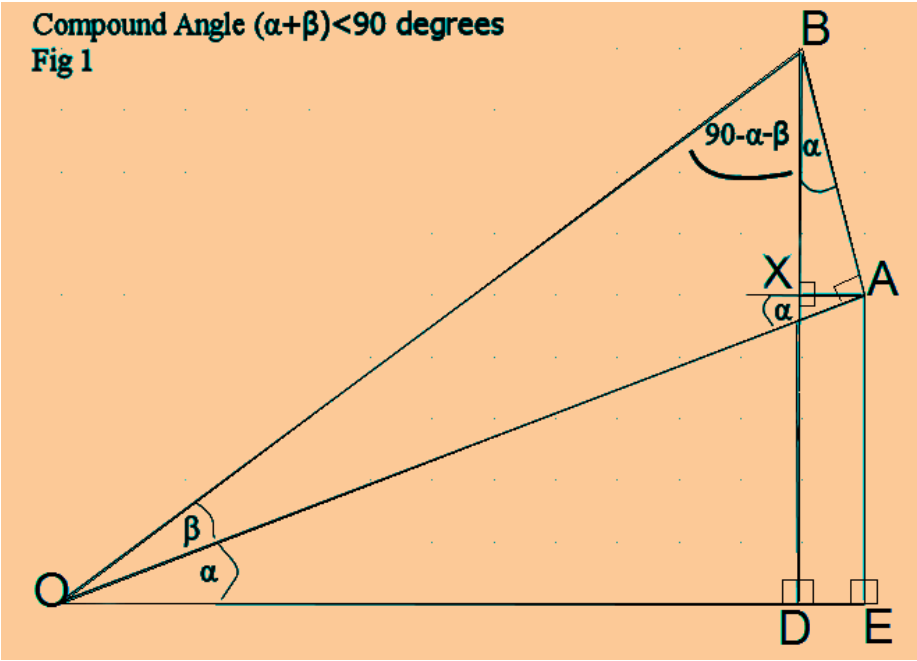

Compound Angle (α+β)<90 degrees
Fig 1
B
90-α-β
α
X
A
α
β
α
O
D
E

Compound Angle Formulas

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

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

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

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

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

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

Show that the compound angle formula for sin(x + y) is true for $x = \frac{\pi}{2}$ and $y = \frac{3\pi}{4}$

$$\sin(x+y) = \sin x \cos y + \cos x \sin y$$

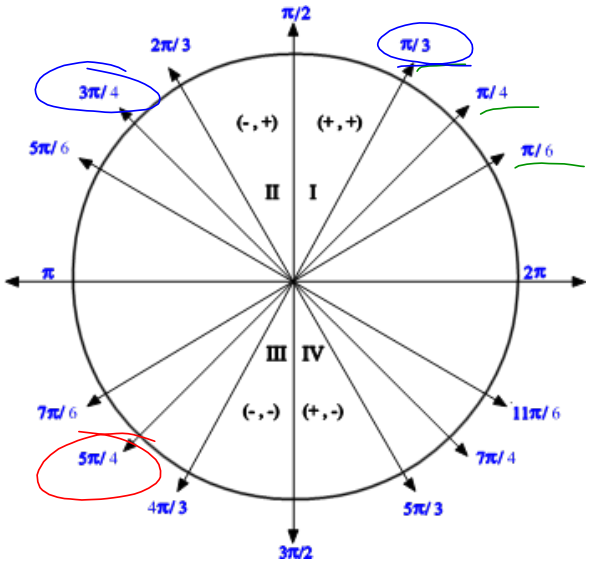
$$\sin\left(\frac{\pi}{2}+\frac{3\pi}{4}\right) = \sin\left(\frac{\pi}{2}\right)\cdot\cos\left(\frac{3\pi}{4}\right) + \cos\left(\frac{\pi}{2}\right)\cdot\sin\left(\frac{3\pi}{4}\right)$$

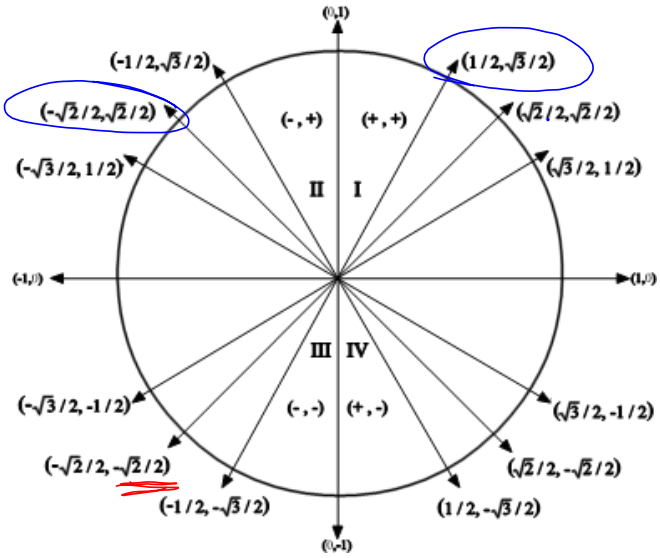
$$\sin\left(\frac{2\pi}{4}+\frac{3\pi}{4}\right) = 1\cdot\left(-\frac{\sqrt{2}}{2}\right) + 0\left(\frac{\sqrt{2}}{2}\right)$$

$$\sin\left(\frac{5\pi}{4}\right) = -\frac{\sqrt{2}}{2}$$

$$= -\frac{\sqrt{2}}{2}$$

(cos, sin)


π/2
2π/3
π/3
3π/4
π/4
5π/6
π/6
(-,+)
(+,+)
II
I
π
2π
III
IV
(-,-)
(+,-)
7π/6
11π/6
5π/4
7π/4
4π/3
5π/3
3π/2


(0,1)
(-1/2,√3/2)
(1/2,√3/2)
(-√2/2,√2/2)
(√2/2,√2/2)
(-√3/2,1/2)
(√3/2,1/2)
(-1,0)
(1,0)
(-√3/2,-1/2)
(√3/2,-1/2)
(-√2/2,-√2/2)
(√2/2,-√2/2)
(-1/2,-√3/2)
(1/2,-√3/2)
(0,-1)

Determine an exact value of $\cos\left(\frac{\pi}{12}\right)$

$\frac{\pi}{12} = \frac{4\pi}{12} - \frac{3\pi}{12}$

$\frac{\pi}{3} - \frac{\pi}{4}$

$\cos\left(\frac{\pi}{12}\right)$

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

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

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

$= \frac{1}{2}\cdot\frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2}\cdot\frac{\sqrt{2}}{2}$

$= \frac{\sqrt{2}}{4} + \frac{\sqrt{6}}{4}$

$= \frac{\sqrt{2}+\sqrt{6}}{4}$

$\sin x = \frac{O}{H}$

Given that $\sin x = \frac{3}{5}$ and $\cos y = -\frac{12}{13}$ $\frac{A}{H}$ and both x and y lie in the second quadrant, determine the value of $\sin(x + y)$

$$\sin(x+y) = \sin x \cos y + \cos x \sin y$$

$$= \frac{3}{5}\left(\frac{-12}{13}\right) + \left(\frac{-4}{5}\right)\left(\frac{5}{13}\right)$$

$$= \frac{-36}{65} - \frac{20}{65}$$

$$= \frac{-56}{65}$$

$$\sin^2 + \cos^2 = 1$$

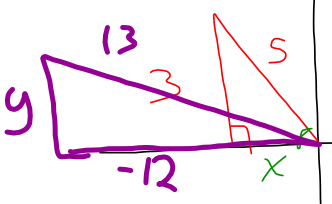
$$\left(\frac{3}{5}\right)^2 + \cos^2 = 1$$

$$\frac{9}{25} + \cos^2 x = 1$$

$$\cos^2 x = 1 - \frac{9}{25}$$

$$\cos^2 x = \frac{16}{25}$$

$$\cos x = \frac{-4}{5}$$



$5^2 - 3^2 = x^2$

$25 - 9 = 4$

$\sqrt{16} = 4$

$13^2 - 12^2 = y^2$

$169 - 144 = y^2$

$\sqrt{25} = y$

$5 = y$

$$\sin y = \frac{5}{13}$$

pg. 232
1, 3 - 7, 8, 10