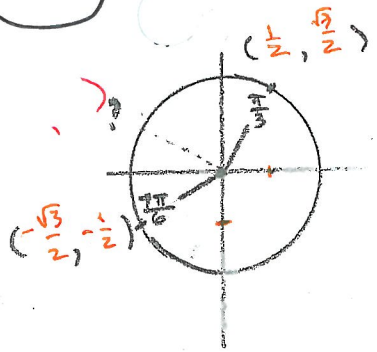
41D page 1



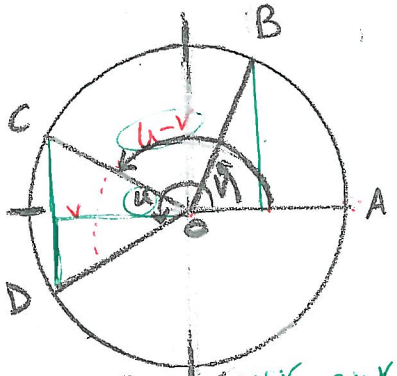
$$\cos\left(\frac{7\pi}{6} - \frac{\pi}{3}\right) = \cos\frac{7\pi}{6}\cos\frac{\pi}{3} + \sin\frac{7\pi}{6}\sin\frac{\pi}{3}$$

$$\cos\left(\frac{7\pi}{6} - \frac{2\pi}{6}\right) \qquad -\frac{\sqrt{3}}{2}\cdot\frac{1}{2} + -\frac{1}{2}\cdot\frac{\sqrt{3}}{2}$$

$$\cos\left(\frac{5\pi}{6}\right) \qquad -\frac{\sqrt{3}}{4} + -\frac{\sqrt{3}}{4}$$

$$-\frac{\sqrt{3}}{2}$$

$$\boxed{-\frac{\sqrt{3}}{2}}$$



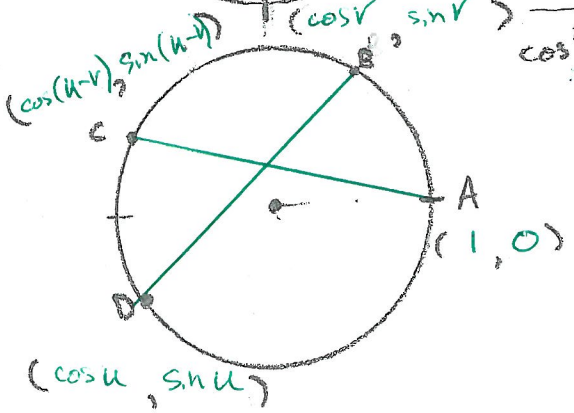
b/c both $= u - v$ $\quad \angle COA = \angle DOB$

therefore segment $\quad \overline{CA} = \overline{DB}$

we can use the distance formula (Pythagorean Thm) to find the segment lengths.

$$\sqrt{(\cos(u-v)-1)^2 + (\sin(u-v)-0)^2} = \sqrt{(\cos u - \cos v)^2 + (\sin u - \sin v)^2}$$

$$(\quad)^2 = (\quad)^2$$



$$\cos^2(u-v) - 2\cos(u-v) + 1 + \sin^2(u-v) = \cos^2 u - 2\cos u\cos v + \cos^2 v + \sin^2 u - 2\sin u\sin v + \sin^2 v$$

$$1 - 2\cos(u-v) + 1 = 1 - 2\cos u\cos v + 1 - 2\sin u\sin v$$

$$2 - 2\cos(u-v) = 2 - 2\cos u\cos v - 2\sin u\sin v$$

$$\frac{-2\cos(u-v)}{-2} = \frac{-2\cos u\cos v - 2\sin u\sin v}{-2}$$

$$\boxed{\cos(u-v) = \cos u\cos v + \sin u\sin v}$$

$$\cos(u+v) = \cos(u-(-v))$$

$$= \cos u\cos(-v) + \sin u\sin(-v)$$

(cos: even; sin: odd)

$$\boxed{\cos(u+v) = \cos u\cos v - \sin u\sin v}$$

$\sin\theta = \cos\left(\frac{\pi}{2} - \theta\right)$

$\sin(A+B) = \cos\left(\frac{\pi}{2} - (A+B)\right)$

$= \cos\left(\left(\frac{\pi}{2} - A\right) - B\right)$

$= \cos\left(\frac{\pi}{2} - A\right)\cos B + \sin\left(\frac{\pi}{2} - A\right)\sin B$

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

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

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

($\cos(-B)$: $\cos$ is even; $\sin(-B)$: $\sin$ is odd)

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

4.1A handout / 1, 5, 9, 13, 17, 21, 25, 27, 31, 35, 47, 50, 51