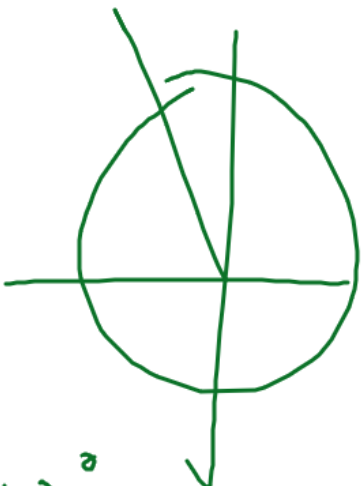
$\sqrt{2}\sqrt{3}$

$$\frac{\sqrt{2}-\sqrt{6}}{4} = \frac{\sqrt{2}(1-\sqrt{3})}{4}$$



~~36~~ 77
71 72

$$\cos 130^\circ \cos 10^\circ + \sin 130^\circ \sin 10^\circ$$

$$\cos(130-10) = \cos 120 = -\frac{1}{2}$$

$[0, 2\pi)$

$\cos\left(x + \frac{\pi}{4}\right) - \cos\left(x - \frac{\pi}{4}\right) = 1$

$\cos x \cos\frac{\pi}{4} - \sin x \sin\frac{\pi}{4} - \left(\cos x \cos\frac{\pi}{4} + \sin x \sin\frac{\pi}{4}\right) = 1$

$-2\sin x \sin\frac{\pi}{4} = 1$

$-2\sin x \left(\frac{\sqrt{2}}{2}\right) = 1$

$\sin x\left(-\sqrt{2}\right) = 1$

$\frac{\sin x\left(-\sqrt{2}\right)}{-\sqrt{2}} = \frac{1}{-\sqrt{2}}$

$\sin x = -\frac{1}{\sqrt{2}} = -\frac{\sqrt{2}}{2}$

$\frac{5\pi}{4}, \frac{7\pi}{4}$

12) $\sin\left(x+\frac{\pi}{6}\right)-\sin\left(x-\frac{7\pi}{6}\right)=\frac{\sqrt{3}}{2}$

$\sin x\cos\frac{\pi}{6}+\cos x\sin\frac{\pi}{6}-\left(\sin x\cos\frac{7\pi}{6}-\cos x\sin\frac{7\pi}{6}\right)=\frac{\sqrt{3}}{2}$

($\cos\frac{7\pi}{6}=-\frac{\sqrt{3}}{2}$, $\sin\frac{7\pi}{6}=-\frac{1}{2}$)

$\frac{\sqrt{3}}{2}\sin x+\frac{1}{2}\cos x+\frac{\sqrt{3}}{2}\sin x-\frac{1}{2}\cos x=\frac{\sqrt{3}}{2}$

$[0,2\pi)$

$\left(\frac{\sqrt{3}}{2}\right)\sin x$

$\frac{\sqrt{3}\sin x}{\sqrt{3}}=\frac{\frac{\sqrt{3}}{2}}{\sqrt{3}}$

$\sin x=\frac{1}{2}$

$\frac{\pi}{6},\frac{5\pi}{6}$

$$\sin 100^\circ \cos 40^\circ - \cos 100^\circ \sin 40^\circ$$

$$\sin(100-40) = \sin 60 = \frac{\sqrt{3}}{2}$$

$$\sin 140^\circ =$$

Double Angle

$\sin(2u)$ $\cos(2u)$ $\tan(2u)$

$\Rightarrow \sin(2u) = \sin(u+u) = \sin u\cos u + \cos u\sin u = 2\sin u\cos u$

$\sin(0) = \sin(u-u) = \sin u\cos u - \cos u\sin u = 0$

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

$$= \boxed{\cos^2 u - \sin^2 u}$$

$$= \cos^2 u - (1 - \cos^2 u)$$

$$\rightarrow = \boxed{2\cos^2 u - 1}$$

$$= (1 - \sin^2 u) - \sin^2 u$$

$$\rightarrow = \boxed{1 - 2\sin^2 u}$$

$\therefore$

$$\cos(0) = \cos(u-u) = \cos u \cos u + \sin u \sin u$$

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

$$= 1$$

$$\tan(2u) = \tan(u+u) = \frac{\tan u + \tan u}{1 - \tan u \tan u}$$

$$\Rightarrow = \boxed{\frac{2\tan u}{1 - \tan^2 u}}$$

$\cos 2x + \cos x = 0$

$2\cos^2 x - 1 + \cos x = 0$

$2\cos^2 x + \cos x - 1 = 0$

$(2\cos x - 1)(\cos x + 1) = 0$

$2\cos x - 1 = 0$

$\cos x = \frac{1}{2}$

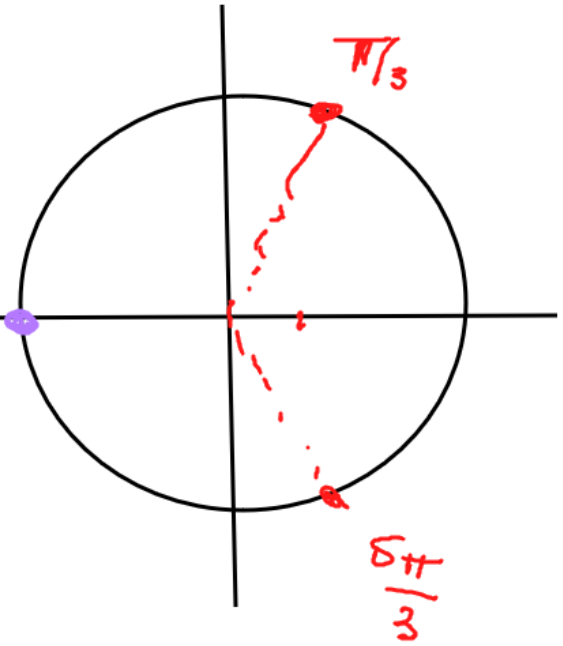
$\frac{\pi}{3} + 2\pi \cdot n$

$\frac{5\pi}{3} + 2\pi \cdot n$

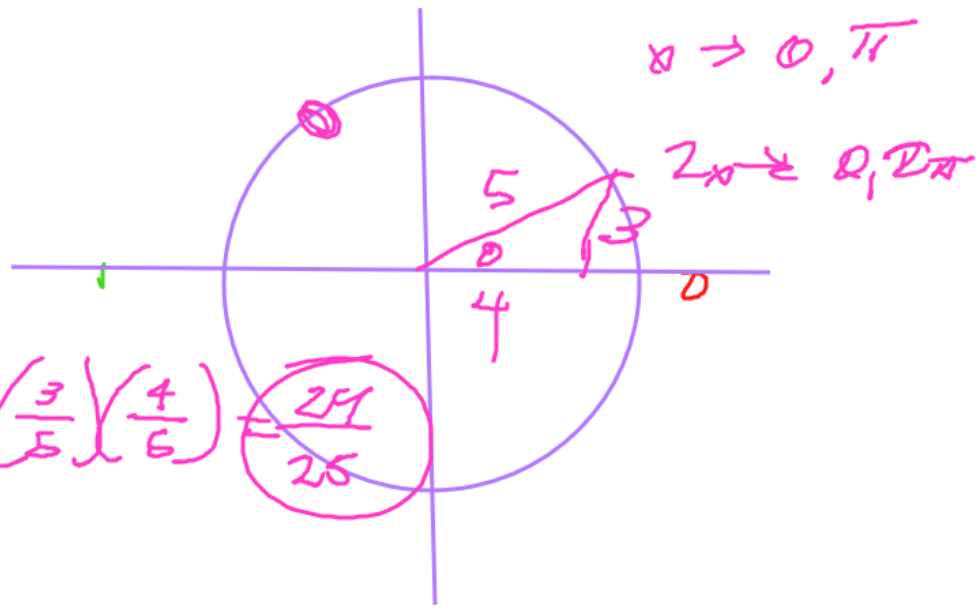
$\cos x + 1 = 0$

$\cos x = -1$

$\pi + 2\pi n$



$\sin x = \frac{3}{5}$ Q1



$\sin(2x) = 2\sin x \cos x = 2\left(\frac{3}{5}\right)\left(\frac{4}{5}\right) = \frac{24}{25}$

$\cos(2x) =$

$\tan(2x) =$

$\frac{1}{}$

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7-12, 15-17, 22-29