sin3A কে sin A এর মাধ্যমে প্রকাশ কর:

$\sin 3A$

$= \sin(2A + A)$

$= \sin 2A . \cos A + \cos 2A . \sin A$

$= 2 . \sin A \cos A . \cos A + (\cos^2 A - \sin^2 A) \sin A$

$= 2 \sin A . \cos^2 A + \cos^2 A . \sin A - \sin^3 A$

$= 2 \sin A (1 - \sin^2 A) + (1 - \sin^2 A) \sin A - \sin^3 A$

$= 2 \sin A - 2 \sin^3 A + \sin A - \sin^3 A - \sin^3 A$

$\therefore \boxed{\sin 3A = 3 \sin A - 4 \sin^3 A}$

$\cos 3A$

$= \cos(2A + A)$

$= \cos 2A . \cos A - \sin 2A . \sin A$

$= (\cos^2 A - \sin^2 A) \cos A - 2 . \sin A . \cos A . \sin A$

$= \cos^3 A - \sin^2 A . \cos A - 2 \sin^2 A . \cos A$

$= \cos^3 A - \cos A (1 - \cos^2 A) - 2 \cos A (1 - \cos^2 A)$

$= \cos^3 A - \cos A + \cos^3 A - 2 \cos A + 2 \cos^3 A$

$= 4 \cos^3 A - 3 \cos A$

$\therefore \boxed{\cos 3A = 4 \cos^3 A - 3 \cos A}$

$$\tan 2A = \tan(A+A)$$

$$= \frac{\tan A + \tan A}{1 - \tan A \cdot \tan A}$$

$$\boxed{\therefore \tan 2A = \frac{2\tan A}{1-\tan^2 A}}$$

13 (i) $$\sec x = \frac{2}{\sqrt{2+\sqrt{2+2\cos 4x}}}$$

R.H.S

$$\frac{2}{\sqrt{2+\sqrt{2+2\cos^2 2x}}}$$

$1 \cos \to 4x$

$$= \frac{2}{\sqrt{2+\sqrt{2(1+\cos^2 4x)}}}$$

$$= \frac{2}{\sqrt{2+\sqrt{2 \cdot 2\cos^2 2x}}}$$

$$= \frac{2}{\sqrt{2+2\cos 2x}}$$

$$= \frac{2}{\sqrt{2(1+\cos 2x)}}$$

$$\frac{2}{\sqrt{2 \cdot 2\cos^2 x}}$$

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

$= \sec x$

$= \text{L.H.S}$

$$2\sin\frac{\pi}{16} = 2\sin 11^\circ 15'$$

$$\sqrt{2-\sqrt{2+\sqrt{2}}}$$

$$2\sin\frac{\pi}{16}$$

$$= 2\sin\frac{180^\circ}{16}$$

$= 2\sin 11^\circ 15'$ = বাম পক্ষ

$$= \sqrt{4\sin^2 11^\circ 15'}$$

$$= \sqrt{2 \cdot (2\sin^2 11^\circ 15')}$$

$$= \sqrt{2(1-\cos 22^\circ 30')}$$

$$= \sqrt{2-2\cos^2 22^\circ 30'}$$

$$= \sqrt{2-\sqrt{2(1+\cos 45^\circ)}}$$

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

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

= ডান পক্ষ

* $2\cos 7\frac{1}{2} = \sqrt{2+\sqrt{2+\sqrt{3}}}$
* $2\cos\frac{\pi}{16} = \sqrt{2+\sqrt{2+\sqrt{2}}}$

H.W

$\boxed{14}$ (i) $4(\sin^3 10^\circ + \cos^3 20^\circ)$

$= 3(\sin 10^\circ + \cos 20^\circ)$

L.H.S

$= 3\sin 10^\circ - \sin 30^\circ + \cos 60^\circ$

$+ 3\cos 20^\circ$

$= 3(\sin 10^\circ + \cos 20^\circ)$

$=$ R.H.S

$\boxed{16}$ $\sin^3 x + \sin^3(120^\circ + x) +$

$\sin^3(240^\circ + x) = -\frac{3}{4}\sin 3x$

L.H.S

$= \frac{1}{4} \cdot 4\sin^3 x + 4\sin^3(120^\circ + x)$

$+ 4\sin^3(240^\circ + x)$

$= \frac{1}{4}\Big[3\sin x - \sin 3x +$

$3\sin(120^\circ + x) - \sin(360^\circ + 3x)$

$+ 3\sin(240^\circ + x) - \sin(720^\circ +$

$3x)\Big]$

$= 3\sin$