William Dunnig

11. $\sin 2\theta + \cos\theta$

$\sin\theta(2 + \cos\theta)$

15. $\sin 4x = 2\sin 2x \cos 2x$

$\sin 2(2x) = 2\sin\cos 2x$

LHS

19. $\sin 3x = (\sin x)(4\cos^2 x - 1)$

LHS $= 4\cos^2 x \sin x - \sin x$

LHS $= 4(1 - \sin^2 x)\sin x - \sin x$

LHS $= (3 - 4\sin^2 x)$

LHS $= -4\sin^3 x$

$\sin 3x = \sin 3x$

31. $\sin(15) = \sin(45 - 30)$

$\sin(15) = \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{3}}{2} - \frac{\sqrt{2}}{2} \cdot \frac{1}{2}$

$\frac{\sqrt{6}}{4} - \frac{\sqrt{2}}{4}$

$\frac{\sqrt{6} - \sqrt{2}}{4}$

35. $\tan\left(7\pi/12\right) \rightarrow \tan\left(\frac{3\pi}{4} - \frac{\pi}{6}\right)$

$\dfrac{1 - \frac{\sqrt{3}}{3}}{1 + 1\left(\frac{\sqrt{3}}{3}\right)}$

$\dfrac{1 + \sqrt{3}}{1 - \sqrt{3}}$

$\dfrac{1 + 2\sqrt{3} + 3}{-2}$

$\dfrac{4 + 2\sqrt{3}}{-2}$

$-\dfrac{2(2 + \sqrt{3})}{2}$

$-(2 + \sqrt{3})$

$-2 - \sqrt{3}$