

5.5, Part III

14. Write as a sum

$$\sin 50^\circ \cos 30^\circ$$

$$\frac{1}{2} [\sin(50^\circ + 30^\circ) + \sin(50^\circ - 30^\circ)]$$

$$\frac{1}{2} [\sin 80^\circ + \sin 20^\circ]$$

15) Write as a product

$$\cos 6x + \cos 2x$$

$$2 \cos\left(\frac{6x+2x}{2}\right) \cos\left(\frac{6x-2x}{2}\right)$$

$$2 \cos 4x \cos 2x$$

(16)

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

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

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

$$\boxed{-2 \cos(\theta + \pi)}$$

Verify: $\cos^2 2x - \sin^2 2x = \cos 4x$

$$\frac{1 + \cos 4x}{2} - \left(\frac{1 - \cos 4x}{2}\right) =$$

$$\frac{1}{2} + \frac{1}{2} \cos 4x - \frac{1}{2} + \frac{1}{2} \cos 4x =$$

$$\cos 4x = \cos 4x \quad \checkmark$$