

Lesson 14.5- Pg 1024 #3-6

$$3. \quad 2\cos 2\theta = 4\cos^2\theta - 2$$

$$4\cos^2\theta - 2 = 2(2\cos^2\theta - 1) = 2\cos 2\theta \quad \checkmark$$

$$4. \quad \sin^2\theta = 1 - \frac{\cos 2\theta + 1}{2}$$

$$1 - \frac{\cos 2\theta + 1}{2} = 1 - \frac{(2\cos^2\theta - 1) + 1}{2} = 1 - \frac{2\cos^2\theta}{2} = 1 - \cos^2\theta = \sin^2\theta \quad \checkmark$$

$$5. \quad \frac{1 + \cos 2\theta}{\sin 2\theta} = \cot\theta$$

$$\frac{1 + \cos 2\theta}{\sin 2\theta} = \frac{1 + (2\cos^2\theta - 1)}{2\sin\theta\cos\theta} = \frac{2\cos^2\theta}{2\sin\theta\cos\theta} = \frac{\cos\theta}{\sin\theta} = \cot\theta \quad \checkmark$$

$$6. \quad \sin 2\theta = \frac{2\tan\theta}{1 + \tan^2\theta}$$

$$\frac{2\tan\theta}{1 + \tan^2\theta} = \frac{2\frac{\sin\theta}{\cos\theta}}{\sec^2\theta} = \frac{2\frac{\sin\theta}{\cos\theta}}{\frac{1}{\cos^2\theta}} = \frac{2\sin\theta}{\cos\theta} \cdot \cos^2\theta = 2\sin\theta\cos\theta = \sin 2\theta \quad \checkmark$$