PAGES 321-322 #1,4,5,7,11, 29-34

① a) $\cos^2\theta + \sin^2\theta = \boxed{1}$

b) $(1-\cos\theta)(1+\cos\theta)$

$= 1 + \cos\theta - \cos\theta - \cos^2\theta$

$= 1 - \cos^2\theta$

$= \boxed{\sin^2\theta}$

c) $(\sin\theta - 1)(\sin\theta + 1)$

$= \sin^2\theta + \sin\theta - \sin\theta - 1$

$= \sin^2\theta - 1$

$= \boxed{-\cos^2\theta}$

④ a) $\dfrac{1}{\cos(90° - \theta)}$

$= \dfrac{1}{\sin\theta}$

$= \boxed{\csc\theta}$

b) $1 - \dfrac{\sin^2\theta}{\tan^2\theta}$

$= 1 - \sin^2\theta \dfrac{1}{\tan^2\theta}$

$= 1 - \sin^2\theta \cot^2\theta$

$= 1 - \dfrac{\sin^2\theta}{1} \cdot \dfrac{\cos^2\theta}{\sin^2\theta}$

$= 1 - \cos^2\theta$

$= \boxed{\sin^2\theta}$

c) $\dfrac{1}{\cos^2\theta} - \dfrac{1}{\cot^2\theta}$

$= \sec^2\theta - \tan^2\theta$

$= \boxed{1}$

⑤ a) $\cos\theta \cot(90°-\theta)$

$$= \cos\theta \tan\theta$$

$$= \frac{\cos\theta}{1} \cdot \frac{\sin\theta}{\cos\theta}$$

$$= \boxed{\sin\theta}$$

b) $\csc^2 x (1-\cos^2 x)$

$$= \csc^2 x \cdot \sin^2 x$$

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

$$= \boxed{1}$$

c) $\cos\quad(\sec\theta - \cos\theta)$

$$= \cos\theta \sec\theta - \cos^2\theta$$

$$= \frac{\cos\theta}{1} \cdot \frac{1}{\cos\theta} - \cos^2\theta$$

$$= 1 - \cos^2\theta$$

$$= \boxed{\sin^2\theta}$$

⑦ $\sin A \tan A + \sin(90°-A)$

$$= \sin A \tan A + \cos A$$

$$= \sin A \cdot \frac{\sin A}{\cos A} + \cos A$$

$$= \frac{\sin^2 A}{\cos A} + \cos A$$

$$= \frac{\sin^2 A}{\cos A} + \frac{\cos A}{1}$$

$$= \frac{\sin^2 A}{\cos A} + \frac{\cos^2 A}{\cos A}$$

$$= \frac{\sin^2 A + \cos^2 A}{\cos A}$$

$$= \frac{1}{\cos A} = \boxed{\sec A}$$

(11) $(\csc x - \cot x)(\sec x + 1)$

$= \csc x \sec x + \csc x - \cot x \sec x - \cot x$

$= \dfrac{1}{\sin x} \cdot \dfrac{1}{\cos x} + \dfrac{1}{\sin x} - \dfrac{\cos x}{\sin x} \cdot \dfrac{1}{\cos x} - \dfrac{\cos x}{\sin x}$

$= \dfrac{1}{\sin x \cos x} + \dfrac{1}{\sin x} - \dfrac{1}{\sin x} - \dfrac{\cos x}{\sin x}$

$= \dfrac{1}{\sin x \cos x} - \dfrac{\cos x}{\sin x}$

$= \dfrac{1}{\sin x \cos x} - \dfrac{\cos^2 x}{\sin x \cos x}$

$= \dfrac{1 - \cos^2 x}{\sin x \cos x}$

$= \dfrac{\sin^2 x}{\sin x \cos x}$

$= \dfrac{\sin x}{\cos x}$

$= \boxed{\tan x}$

(29) $\cot^2 \theta + \cos^2 \theta + \sin^2 \theta = \csc^2 \theta$ GIVEN

$\cot^2 \theta + 1 = \csc^2 \theta$ PYTHAGOREAN IDENTITY

$\csc^2 \theta = \csc^2 \theta$ ∎   PYTHAGOREAN IDENTITY