

TABLE A6.4 *Trigonometric Identities*

$$\exp(\pm j\theta) = \cos \theta \pm j \sin \theta$$

$$\cos \theta = \frac{1}{2}[\exp(j\theta) + \exp(-j\theta)]$$

$$\sin \theta = \frac{1}{2j}[\exp(j\theta) - \exp(-j\theta)]$$

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

$$\cos^2 \theta - \sin^2 \theta = \cos(2\theta)$$

$$\cos^2 \theta = \frac{1}{2}[1 + \cos(2\theta)]$$

$$\sin^2 \theta = \frac{1}{2}[1 - \cos(2\theta)]$$

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

$$\sin(\alpha \pm \beta) = \sin \alpha \cos \beta \pm \cos \alpha \sin \beta$$

$$\cos(\alpha \pm \beta) = \cos \alpha \cos \beta \mp \sin \alpha \sin \beta$$

$$\tan(\alpha \pm \beta) = \frac{\tan \alpha \pm \tan \beta}{1 \mp \tan \alpha \tan \beta}$$

$$\sin \alpha \sin \beta = \frac{1}{2}[\cos(\alpha - \beta) - \cos(\alpha + \beta)]$$

$$\cos \alpha \cos \beta = \frac{1}{2}[\cos(\alpha - \beta) + \cos(\alpha + \beta)]$$

$$\sin \alpha \cos \beta = \frac{1}{2}[\sin(\alpha - \beta) + \sin(\alpha + \beta)]$$
