Table of Trigonometric Identities

We don't use these much, but it's nice to have a table. The first five comprise Table 2.2 on p. 14 of *DSP First*.

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

2. $\cos 2\theta = \cos^2\theta - \sin^2\theta$

3. $\sin 2\theta = 2\sin\theta\cos\theta$

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

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

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

7. $\cos\alpha\cos\beta = \frac{1}{2}\cos(\alpha-\beta) + \frac{1}{2}\cos(\alpha+\beta)$

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

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

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

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

12. $\cos\alpha + \cos\beta = 2\cos\frac{1}{2}(\alpha+\beta)\cos\frac{1}{2}(\alpha-\beta)$

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

14. $\sin^2\theta = \frac{1}{2}(1-\cos 2\theta)$

15. $\cos^2\theta = \frac{1}{2}(1+\cos 2\theta)$

16. $\sin\theta = \cos(\theta-\frac{\pi}{2})$

17. $\cos\theta = \sin(\theta+\frac{\pi}{2})$