In Exercises 1–8, find the exact value of each expression.

3. (a) $\sin\left(\dfrac{7\pi}{6} - \dfrac{\pi}{3}\right)$ (b) $\sin\dfrac{7\pi}{6} - \sin\dfrac{\pi}{3}$

In Exercises 9–18, use the sum and difference formulas to find the exact values of the sine, cosine, and tangent of the angle.

11. $105° = 60° + 45°$

13. $195° = 225° - 30°$

15. $\dfrac{11\pi}{12} = \dfrac{3\pi}{4} + \dfrac{\pi}{6}$

In Exercises 19–28, use the sum and difference formulas to write the expression as the sine, cosine, or tangent of an angle.

19. $\cos 40° \cos 15° - \sin 40° \sin 15°$

20. $\sin 110° \cos 80° + \cos 110° \sin 80°$

21. $\sin 340° \cos 50° - \cos 340° \sin 50°$

22. $\cos 20° \cos 30° + \sin 20° \sin 30°$

23. $\dfrac{\tan 325° - \tan 86°}{1 + \tan 325° \tan 86°}$ 24. $\dfrac{\tan 140° - \tan 60°}{1 + \tan 140° \tan 60°}$

In Exercises 35–38, find the exact value of the trigonometric function given that

$\sin u = 5/13$,   where $0 < u < \pi/2$

$\cos v = -3/5$,   where $\pi/2 < v < \pi$.

35. $\sin(u + v)$ 36. $\cos(v - u)$

37. $\cos(u + v)$ 38. $\sin(u - v)$

In Exercises 39–42, find the exact value of the trigonometric function given that

$\sin u = 7/25$,   where $\pi/2 < u < \pi$

$\cos v = 4/5$,   where $3\pi/2 < v < 2\pi$.

39. $\cos(u + v)$ 40. $\sin(u + v)$

In Exercises 43–50, verify the identity.

43. $\cos(\pi - \theta) + \sin\left(\dfrac{\pi}{2} + \theta\right) = 0$

46. $\tan\left(\dfrac{\pi}{4} - \theta\right) = \dfrac{1 - \tan\theta}{1 + \tan\theta}$