HW #45 p. 34 1-5 odd 11-21 odd

1. $\cos 75° = \frac{\sqrt{6} - \sqrt{2}}{4}$

3. $\sin \frac{11\pi}{12} = \sin\left(\frac{2\pi}{12} + \frac{9\pi}{12}\right)$

$= \sin\left(\frac{\pi}{6} + \frac{3\pi}{4}\right) = \sin\frac{\pi}{6}\cos\frac{3\pi}{4} + \cos\frac{\pi}{6}\sin\frac{3\pi}{4}$

$= \frac{1}{2} \cdot \left(\frac{-\sqrt{2}}{2}\right) + \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2}$

$= \boxed{\frac{-\sqrt{2} + \sqrt{6}}{4}}$ $= \frac{-\sqrt{2}}{4} + \frac{\sqrt{6}}{4}$

5. $\tan \frac{23\pi}{12} = \tan\left(\frac{8\pi}{12} + \frac{15\pi}{12}\right)$

$= \tan\left(\frac{2\pi}{3} + \frac{5\pi}{4}\right)$

$\tan\frac{2\pi}{3} = -\sqrt{3}$

$\frac{\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \frac{\sqrt{3}}{3} \cdot -\frac{2}{1}$

$\tan\frac{5\pi}{4} = 1$

$\frac{-\frac{\sqrt{2}}{2}}{\frac{\sqrt{2}}{2}}$

$= \frac{\tan\frac{2\pi}{3} + \tan\frac{5\pi}{4}}{1 - \tan\frac{2\pi}{3}\tan\frac{5\pi}{4}}$

$= \frac{-\sqrt{3} + 1}{1 - (-\sqrt{3} \cdot 1)} = \frac{-\sqrt{3} + 1}{1 + \sqrt{3}} \cdot \frac{(1 - \sqrt{3})}{(1 - \sqrt{3})}$

$= \frac{1 - 2\sqrt{3} + 3}{1 - 3} = \frac{4 - 2\sqrt{3}}{-2}$

$= \boxed{-2 + \sqrt{3}}$

11. $\tan(43° - 13°) = \tan(30°) = \boxed{\frac{\sqrt{3}}{3}}$

13. $\sin(15° + 75°) = \sin 90° = \boxed{1}$

15. $\cos(40° + 20°) = \cos(60) = \boxed{\frac{1}{2}}$

17. $\tan(2\theta - \theta) = \boxed{\tan\theta}$

19. $\sin(3y + y) = \boxed{\sin 4y}$

21. $\cos(x - 2x) = \cos(-x) = \boxed{\cos x}$