9. Woodstock is in a helicopter is taking pictures of a waterfall that is 240 meters tall. The helicopter is hovering 50 meters away from the waterfall and level with its highest point. Woodstock is focusing his camera on a point halfway down the waterfall. At what angle is the camera lens tilted down from the horizontal?

10. A forester is estimating the amount of lumber contained in a tree. When he stands 29 feet away from the tree, the angle to the top of the tree is 55° as measured from his eye-level height, 5 feet above the ground. What is the height of the tree?

11. Schroeder is standing 30 feet away from a building. His angle of elevation to the top of a window in the building is 65° and to the bottom of the window is 60°. What is the height of the window?

12. At a certain distance, the angle of elevation to the top of a building is 60°. From 40 feet further back, the angle of elevation is 45° . Find the height of the building.

7.6 Unit Circle

Determine the exact value of each:

1. $\sin 45°$ $\frac{\sqrt{2}}{2}$
2. $\cos 0$ 1
3. $\sin -210°$ $\frac{1}{2}$
4. $\cos \frac{3\pi}{4}$ $-\frac{\sqrt{2}}{2}$
5. $\sin \frac{4\pi}{3}$ $-\frac{\sqrt{3}}{2}$
6. $\cos 240°$ $-\frac{1}{2}$
7. $\sin \frac{8\pi}{3}$ $\frac{\sqrt{3}}{2}$
8. $\cos -90°$ 0
9. $\sin -855°$ $-\frac{\sqrt{2}}{2}$
10. $\cos 570°$ $-\frac{\sqrt{3}}{2}$
11. $\sin 270°$ -1
12. $\cos -\frac{\pi}{3}$ $\frac{1}{2}$
13. $\sin -3\pi$ 0
14. $\cos \frac{11\pi}{6}$ $\frac{\sqrt{3}}{2}$

7.7 Using the Unit Circle

Determine the exact value of each:

1. $\sin 225°$ $-\frac{\sqrt{2}}{2}$
2. $\cos 150°$ $-\frac{\sqrt{3}}{2}$
3. $\tan 60°$ $\sqrt{3}$
4. $\sin\frac{\pi}{6}$ $\frac{1}{2}$
5. $\sec\frac{2\pi}{3}$ -2
6. $\cot\frac{5\pi}{3}$ $-\frac{\sqrt{3}}{3}$
7. $\tan 90°$ undefined
8. $\cos\pi$ -1
9. $\csc\frac{3\pi}{4}$ $\sqrt{2}$
10. $\sin 2\pi$ 0
11. $\cos -30°$ $\frac{\sqrt{3}}{2}$
12. $\sec 585°$ $-\sqrt{2}$
13. $\cot 180°$ undefined
14. $\sin\frac{\pi}{2}$ 1
15. $\cos 270°$ 0
16. $\sec\frac{7\pi}{6}$

6. $\cot\frac{5\pi}{3} = \frac{\frac{1}{2}}{\frac{-\sqrt{3}}{2}} = \frac{1}{2}\cdot\frac{2}{-\sqrt{3}} = \frac{-1}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}} = \boxed{-\frac{\sqrt{3}}{3}}$

9. $\csc\frac{3\pi}{4} = \frac{1}{\frac{\sqrt{2}}{2}} = 1\cdot\frac{2}{\sqrt{2}} = \frac{2}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}} = \frac{2\sqrt{2}}{2} = \boxed{\sqrt{2}}$

12. $\sec 585° = \sec 225 = \frac{1}{\cos 225} = \frac{1}{\frac{-\sqrt{2}}{2}} = 1\cdot\frac{2}{-\sqrt{2}} = \frac{-2}{\sqrt{2}}\cdot\frac{\sqrt{2}}{\sqrt{2}} = \frac{-2\sqrt{2}}{2} = \boxed{-\sqrt{2}}$

16. $\sec\frac{7\pi}{6} = \frac{1}{\cos\frac{7\pi}{6}} = \frac{1}{\frac{-\sqrt{3}}{2}} = 1\cdot\frac{-2}{\sqrt{3}} = \frac{-2}{\sqrt{3}}\cdot\frac{\sqrt{3}}{\sqrt{3}} = \boxed{-\frac{2\sqrt{3}}{3}}$