

Trigonometry Lesson 3: Finding Trigonometric Values

Textbook section 7.3

1. Use what we know about the unit circle to find the following trigonometric values:

$$\sin\left(\frac{2\pi}{3}\right)$$

$$\tan\left(\frac{7\pi}{4}\right)$$

$$\cot\left(\frac{4\pi}{3}\right)$$

$$\sin\left(\frac{5\pi}{6}\right)$$

$$\sec\left(\frac{5\pi}{3}\right)$$

$$\cos\left(\frac{5\pi}{4}\right)$$

$$\csc\left(\frac{7\pi}{6}\right)$$

$$\tan\left(\frac{3\pi}{2}\right)$$

$$\sec\left(\frac{11\pi}{6}\right)$$

2. Develop a strategy to find trigonometric values for angles outside of the first revolution (that is, outside of the interval $[0, 2\pi)$, and use it to find the following:

$$\cos\left(\frac{9\pi}{2}\right)$$

$$\sin\left(\frac{47\pi}{4}\right)$$

$$\cot\left(\frac{11\pi}{4}\right)$$

$$\sec\left(\frac{55\pi}{2}\right)$$

$$\tan\left(\frac{23\pi}{6}\right)$$

$$\csc\left(\frac{45\pi}{18}\right)$$

Does adding or subtracting 2π to an angle change its trigonometric values? Explain.

3. Evaluate the following trigonometric functions at the stated angles.

$$\sin\left(\frac{\pi}{6}\right)$$

$$\sin\left(-\frac{\pi}{6}\right)$$

$$\cos\left(\frac{\pi}{6}\right)$$

$$\cos\left(-\frac{\pi}{6}\right)$$

$$\sin\left(\frac{\pi}{4}\right)$$

$$\sin\left(-\frac{\pi}{4}\right)$$

$$\cos\left(\frac{\pi}{4}\right)$$

$$\cos\left(-\frac{\pi}{4}\right)$$

$$\sin\left(\frac{\pi}{3}\right)$$

$$\sin\left(-\frac{\pi}{3}\right)$$

$$\cos\left(\frac{\pi}{3}\right)$$

$$\cos\left(-\frac{\pi}{3}\right)$$

$$\sin\left(\frac{\pi}{2}\right)$$

$$\sin\left(-\frac{\pi}{2}\right)$$

Is there a pattern between, say, $\sin \theta$ and $\sin(-\theta)$? $\cos \theta$ and $\cos(-\theta)$? How might this help us deal with negative angles?

4. Using the *even* and *odd* properties of cosine and sine, respectively, prove similar properties for the rest of the trigonometric functions:

$$\tan(-\theta)$$

$$\csc(-\theta)$$

$$\sec(-\theta)$$

$$\cot(-\theta)$$

5. Using the strategies developed in previous exercises, find the following trigonometric values:

$$\sin\left(\frac{25\pi}{3}\right)$$

$$\cos\left(-\frac{7\pi}{3}\right)$$

$$\tan\left(\frac{2\pi}{3}\right)$$

$$\sec\left(-\frac{7\pi}{6}\right)$$

$$\sin\left(\frac{\pi}{2} + 7\pi\right)$$

$$\cot\left(-\frac{23\pi}{4}\right)$$

$$\tan\left(\frac{17\pi}{2}\right)$$

$$\csc(3\pi)$$

$$\tan\left(-\frac{\pi}{4}\right)$$

$$\sin\left(\frac{-5\pi}{6}\right)$$

$$\cos\left(-\frac{7\pi}{3}\right)$$

$$\sin\left(\frac{25\pi}{3}\right)$$

$$\csc\left(\frac{\pi}{2} + 7\pi\right)$$

$$\sec\left(\frac{7\pi}{6}\right)$$

$$\cot\left(-\frac{23\pi}{4}\right)$$

$$\csc(731\pi)$$

6. Extra practice: find the following trigonometric values:

$$\cot\left(-\frac{5\pi}{3}\right)$$

$$\tan\left(-\frac{5\pi}{6}\right)$$

$$\sec\left(-\frac{2\pi}{3}\right)$$

$$\sin\left(-\frac{5\pi}{6}\right)$$

$$\sec\left(\frac{11\pi}{4}\right)$$

$$\cos\left(-\frac{3\pi}{4}\right)$$

$$\csc\left(-\frac{\pi}{2}\right)$$

$$\cot\left(\frac{\pi}{6} + 7\pi\right)$$

$$\tan\left(-\frac{27\pi}{4}\right)$$

$$\sin\left(\frac{19\pi}{2}\right)$$

$$\cos(-57\pi)$$

$$\csc\left(\frac{34\pi}{6}\right)$$

Homework Assignment: finish any unworked problems on this worksheet, textbook pg. 486 #s 25-40 (odd), pg. 525 #s 33-36 (odd)