

Math 261
Fall 2015
Homework Set 1

1. Without using a calculator, complete the following table by finding the exact values (no approximation)

	$\frac{7\pi}{6}$	$\frac{17\pi}{4}$	$\frac{5\pi}{3}$	7π	$\frac{15\pi}{2}$
cos					
sin					
tan					
cot					
sec					
csc					

2. Without using a calculator, complete the following table by finding the exact values (no approximation)

	$-\frac{7\pi}{3}$	$-\frac{17\pi}{6}$	$-\frac{5\pi}{2}$	-10π	$-\frac{13\pi}{4}$
cos					
sin					
tan					

3. (a) Simplify

$$\frac{\pi}{3} + \frac{\pi}{4}.$$

(b) Using the appropriate trigonometric identities, find

i. $\sin\left(\frac{7\pi}{12}\right).$

ii. $\cos\left(\frac{7\pi}{12}\right).$

iii. $\tan\left(\frac{7\pi}{12}\right).$

4. Justify why the following trig identities hold true

(a)

$$1 + \cot^2(x) = \csc^2(x).$$

(b)

$$1 + \tan^2(x) = \sec^2(x).$$

(c)

$$\frac{\cos x}{1 + \sin x} + \tan x = \sec x.$$

5. Find each of the following exactly in radians

(a)

$$\sin^{-1}\left(\frac{\sqrt{2}}{2}\right)$$

(b)

$$\cos^{-1}\left(-\frac{1}{2}\right)$$

(c)

$$\tan^{-1}\left(-\frac{\sqrt{3}}{3}\right)$$

(d)

$$\tan^{-1}(1)$$

(e)

$$\sin^{-1}\left(-\frac{\sqrt{3}}{2}\right)$$

6. Solve the following equations

(a) $2 \cos x = -1$

(b) $4 \sin^2 x = 1$

(c) $3 \tan 2x = -3$ where $0 \leq x < 2\pi$

(d) $\cos x = \sqrt{2}$

(e) $2 \cos^2(x) \tan(x) = \tan(x)$ where $0 \leq x < 2\pi$