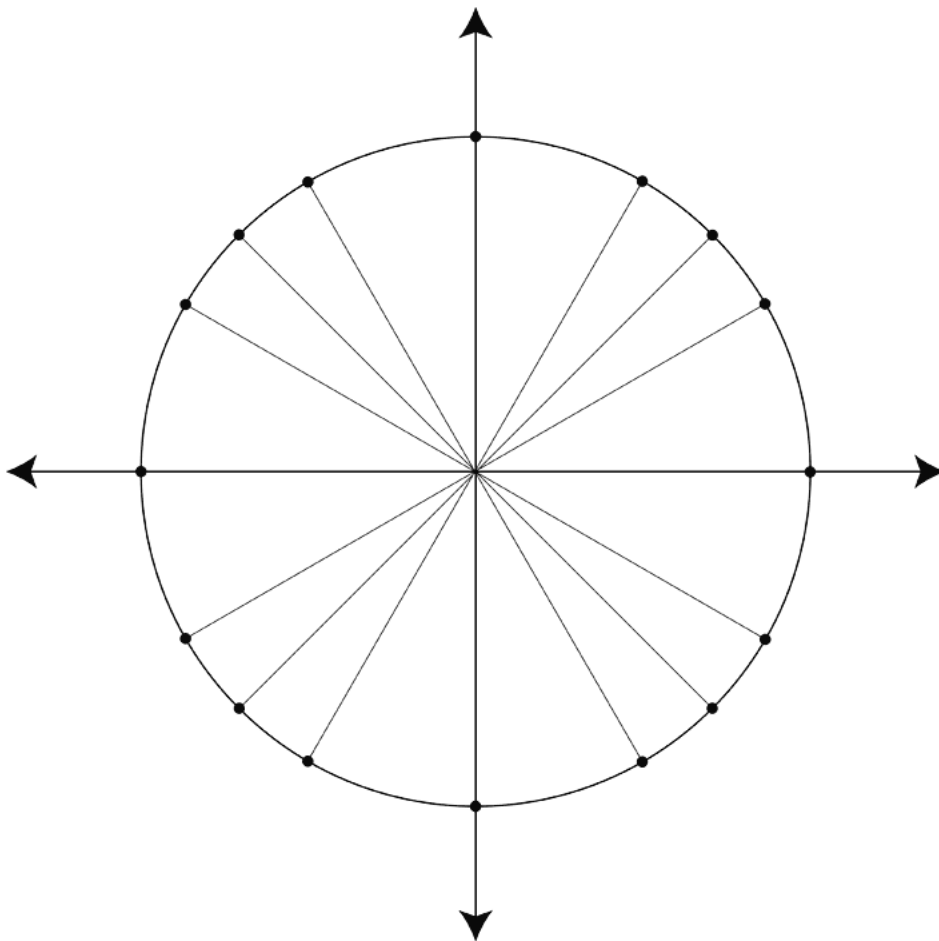


MATH 220: CALCULUS I  
WORKSHEET 3  
JANUARY 22, 2013

1. Fill in all “special” angles and  $(x, y)$  points in the following unit circle:



2. Use trig identities to solve the following in terms of other trig functions:

(a)  $2 - 2\sin^2(x)$

(b)  $2 - \sec^2(\theta)$

(c)  $3\csc^2(x) - 2$

3. For each equation, find a positive and a negative angle  $\theta$  that makes it true.

(a)  $\sin \theta = -\frac{1}{2}$

(b)  $\tan \theta = -1$

(c)  $\cot \theta = \sqrt{3}$

(d)  $\sec \theta = \sqrt{2}$

4. Given trig ratio for one function and the range, find the ratio for the others.

(a) If  $\sec(x) = -\frac{3}{2}$  and  $\frac{\pi}{2} < x < \pi$ , then find  $\csc(x)$  and  $\tan(x)$ .

(b) If  $\cos(x) = -\frac{1}{3}$  and  $\pi < x < \frac{3\pi}{2}$ , then find  $\sin(x)$  and  $\sec(x)$ .

(c) If  $\cot(x) = 3$  and  $\pi < x < 2\pi$ , then find  $\cos(x)$  and  $\sin(x)$ .

5. Use laws of exponents and logarithms to rewrite and simplify the following:

(a)  $\frac{9^{-3}}{3^{-8}}$

(b)  $27^{2/3}$

(c)  $\ln 1 + \ln(e^2)$

6. For large values of  $x$ , which function is greater,  $y = 2^x$  or  $y = x^{2000}$ ?

For large values of  $x$ , which values of  $a > 0$  guarantee  $y = a^x$  is bigger than  $y = x^a$ ?

7. Roughly sketch the following functions:

(a)  $y = \sin(x)$

(b)  $y = \cos(x)$

(c)  $y = e^x$

(d)  $y = e^{-x}$

(e)  $y = \ln(x)$

(f)  $y = \sqrt{x}$