Math 123 Exam 3

December 4, 2013 Professor Ilya Kofman

NAME: _____

No calculators allowed on this exam.

1. The point $P(x, y)$ is on the unit circle in quadrant II. If $y = \frac{2}{\sqrt{7}}$, find x.

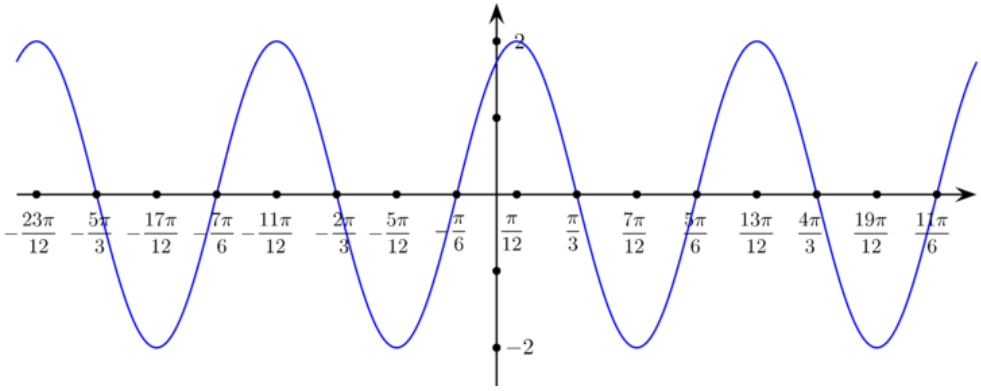
2. **(a)** Draw the terminal point $P(t)$ on the unit circle corresponding to $t = \frac{7\pi}{6}$.

(b) The reference angle =_____

(c) $\sin(t)$ =_____

(d) $\cos(t)$ =_____

3. Determine the trigonometric function for the graph shown below.



amplitude=_____ period=_____ phase shift=_____

$y =$ _____

4. Find the exact value:

(a) $\cos(\frac{5\pi}{6}) =$_____

(b) $\sin(\frac{2\pi}{3}) =$_____

(c) $\tan(\frac{3\pi}{4}) =$_____

(d) $\csc(\frac{\pi}{4}) =$_____

(e) $\sec(\frac{11\pi}{6}) =$_____

(f) $\sin(\frac{3\pi}{2}) =$_____

(g) $\cos(-\frac{\pi}{4}) =$_____

(h) $\tan(-\frac{\pi}{3}) =$_____

(i) $\csc(3\pi) =$_____

(j) $\sec(-\frac{2\pi}{3}) =$_____

5. If $\cos t = \frac{12}{13}$, with terminal point $P(t)$ in quadrant IV, find the exact value:

(a) $\sin t =$_____

(b) $\tan t =$_____

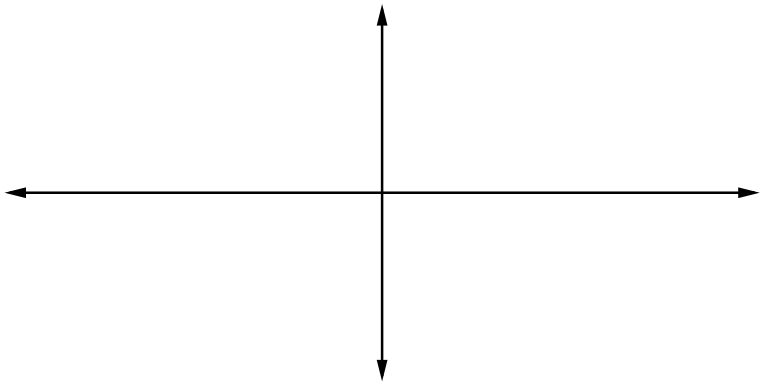
(c) $\sec t =$_____

(d) $\csc t =$_____

(e) $\cot t =$_____

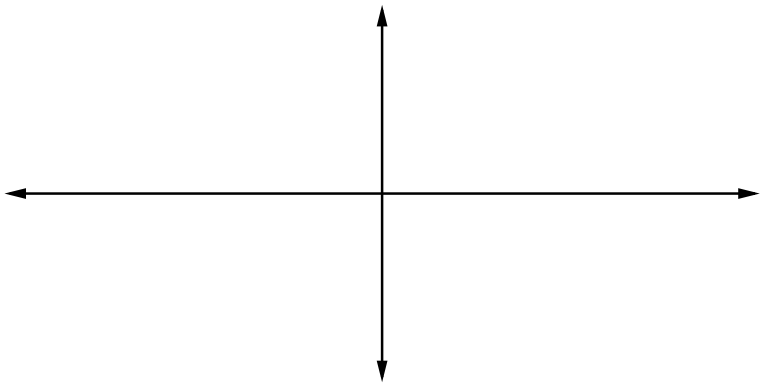
6. Let $y = -4\cos(\frac{1}{2}x)$. Sketch one period. Label the x–intercepts, and the max & min values on the y–axis.

(a) amplitude=_____ **(b)** period=_____ **(c)** phase shift=_____

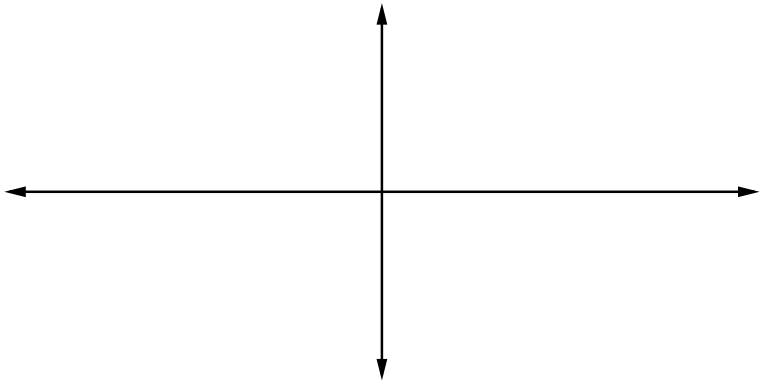


7. Let $y = 2\sin(3x + \frac{\pi}{2})$. Sketch one period. Label the x–intercepts, and the max & min values on the y–axis.

(a) amplitude=_____ **(b)** period=_____ **(c)** phase shift=_____



8. Let $y = \tan(x - \frac{\pi}{4})$. Sketch one period. Label the x–intercepts. **(a)** period=_____



9. A mass suspended from a spring oscillates in simple harmonic motion at a frequency of 6 cycles per second. The distance between the highest and lowest point of the oscillation is 20 cm. The mass is at its lowest point at time $t = 0$.

(a) Find an equation $y = f(t)$ that describes the displacement of the mass as a function of time.

(b) amplitude=_____ period=_____ phase shift=_____

(c) Graph the function $y = f(t)$.