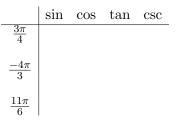
## EXAM 3 - MATH 140 DATE: Friday, November 12 INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

## GOOD LUCK!!

1. (a) Copy and fill in the missing entries in the following table



(b) Starting from known trigonometric numbers calculate for me the numbers

$$\sin\frac{\pi}{12}$$
 and  $\cos\frac{5\pi}{12}$ .

- 2. If  $\tan \theta = \frac{4}{3}$  and  $\pi < \theta < \frac{3\pi}{2}$ , find  $\sin \theta$  and  $\cos \theta$ .
- 3. Suppose that you are given a wave whose amplitude is 3 units, its period is  $\frac{\pi}{6}$  and its phase shift is  $-\frac{\pi}{2}$ . Find an equation that describes this wave and then roughly sketch its graph over 2 periods. (**Please**, **please**, **try** to label critical points on your graph!!)
- 4. Find the exact value of  $\sin(\cos^{-1}(-\frac{2}{5}))$ . **Please**, do not omit any details.
- 5. Start from the left and show that

$$\frac{\cos\theta}{1-\tan\theta} + \frac{\sin\theta}{1-\cot\theta} = \sin\theta + \cos\theta.$$

Please, do not omit any steps.

6. Calculate  $\sin\left[\frac{\pi}{4} - \cos^{-1}\left(-\frac{4}{5}\right)\right]$ .