Midterm II: Some problems for review

The exam will be taken at the Testing Center during 6/13 - 6/14. At the Testing Center, you go to Canvas and navigate to Midterm II in Week 7 module. You will be directed to WebAssign. It will ask you for an access code. The proctor will give you the code or enter the code for you. Most questions are multiple-choice and are automatically graded. You have an option to show your work so that you can earn some extra credit even if your final answer is incorrect. There will be some proof problems that require you to either type in a box or write your solutions on the scratch papers. Your scratch papers will be collected at the end of your exam time.

The material covered is Section 6.5, 6.6, 7.1 - 7.5, 8.1, 8.2. It is a closed book exam. No notes are allowed. The trigonometric identities will be provided on the exam, so you don't have to memorize them. A scientific or graphing calculator is allowed. Phones are not allowed. You should review the homework problems, quizzes, and examples given in the lectures. It is always a good idea to study for the exam with someone. Some additional problems to practice:

1) State the Law of Sines. In which cases of the four cases ASA, SSA, SAS, SSS can we use the Law of Sines to solve the triangle? Which of the cases can lead to more than one solution? Which of the cases can lead to no solutions?

2) State the Law of Cosines. In which cases of the four cases ASA, SSA, SAS, SSS can we use the Law of Cosines to solve the triangle?

3) Solve the triangle ABC with $A = 30°$, $BC = 21$, $AC = 27$.

4) Solve the triangle ABC with $AB = 4$, $BC = 5$, $AC = 6$.

5) Express $3\sin x - 4\cos x$ as a function of sine only.

6) Express $3\sin(2x) + 4\cos(2x)$ as a function of cosine only.

7) Use suitable trigonometric identities to prove the identity

$$\frac{\cos^2 x}{1 - \sin x} = \frac{\cos x}{\sec x - \tan x}$$

8) Use suitable trigonometric identities to prove the identity

$$\csc x - \tan\left(\frac{x}{2}\right) = \cot x$$

9) Use suitable trigonometric identities to prove the identity

$$\frac{\sin(2x)}{\sin x} - \frac{\cos(2x)}{\cos x} = \sec x$$

10) Solve the equation $4\sin x - 5 = 0$ for $0 \le x \le 2\pi$.

11) Solve the equation $4\sin x - 3 = 0$ for $0 \le x \le 2\pi$.

12) Solve the equation $\sin x = \cos(2x)$ for $0 \le x \le 2\pi$.

13) Solve the equation $\frac{1-\cos x}{1+\cos x} = 3$ for $0 \le x \le 2\pi$.

14) A point $P(x, y)$ is given in rectangular coordinates. Plot the point P. Find one pair of polar coordinates for P with $r > 0$. Find one pair of polar coordinates for P with $r < 0$.

(a) $(-\sqrt{2}, \sqrt{6})$

(b) $(4, -4)$

15) Sketch the graph of the polar equation.

    (a) $r = 3 + 3\cos\theta$

    (b) $r = 2\sin(2\theta)$