Practice Midterm Exam 10/1

You have 60 minutes. Please show all your work; if I can't follow your logic, I can't give you partial credit. Your answers for all questions should be exact numbers with no decimals.

1. (10 pts) Using the unit circle, find $\sin 330°$, $\cos(\pi/6)$, and $\tan(3\pi/4)$.

2. (40 pts) Consider an angle $\theta = 108°$.
   (a) (10 pts) Convert θ to radians.

   (b) (10 pts) Find a coterminal angle for θ.

   (c) (10 pts) What quadrant does θ lie in?

   (d) (10 pts) Based on the answer to your previous question, which of $\sin\theta, \cos\theta,$ or $\tan\theta$ is positive?

3. (30 pts) An angle θ in the fourth quadrant has a sine of $-5/13$.

   (a) (10 pts) Using an appropriate Pythagorean identity, find $\cos\theta$.

   (b) (20 pts) Use $\sin\theta$ and the value of $\cos\theta$ you obtained to find $\tan\theta, \cot\theta, \sec\theta$, and $\csc\theta$.

4. (20 pts) A 25-foot ladder is leaned against the wall of a house. The wall makes a right angle with the ground.

   (a) (10 pts) Suppose the base of the ladder is placed 15 feet away from the wall. How far up the wall does the ladder reach? (It may help to draw a diagram.)

   (b) (10 pts) Suppose the base of the ladder is placed 7 feet away from the wall. If θ is the angle the ladder makes with the ground, find $\cos\theta$.