

Math 120 – Teamwork # 5

You may write your work here, on the back, or on another sheet of paper. Please box your answers.

1. For the problems below, draw the right triangle(s) described in the problem, and then find the answer. Round your answer to three decimal places.
- a. A ladder 12 meters long reaches from the ground to a window 11 meters high. How far from the wall is the foot of the ladder, and what angle does it make with the horizontal?



- b. From the top of a building 28 meters high, the angle of depression to an automobile is $29^{\circ}14'32''$. How far is the automobile from the foot of the building measured horizontally?

2. Solve the following equations on the interval $0 \leq \theta < 2\pi$.

a. $3\sqrt{2} \sin \theta + 2 = -1$

b. $\frac{\sin(6\theta) - \sin(4\theta)}{\cos(5\theta)} = -\tan\left(\frac{\pi}{3}\right)$ [Hint: use sum-to-product formula]

- 3.** The course for a boat race starts at point A and proceeds in the direction S 52° W (this means 52° west of due south) to point B , then in the direction S 40° E (this means 40° east of due south) to point C , and finally back to A . Point C lies 8 kilometers directly south of point A . Approximate the distance of the complete race course.

- 4.** Solve the following equations on the interval $0 \leq \theta < 2\pi$.

a. $1 + \sqrt{3} \cos \theta + \cos(2\theta) = 0$

b. $\cos(2\theta) = -\cos \theta$