Practical Trig Problems
Written by the students of Mr. Pleacher

1. A motorboat leaves Menemsha Harbor and travels for 4 miles at a bearing of 6 degrees and then turns and travels for 9 miles at a bearing of 7 degrees.   The boat runs aground and begins to sink.   It radios the Menemsha Coast Guard and a rescue boat leaves in a straight path for the sinking vessel traveling at 25 mph.   The vessel will be completely submerged in half an hour. Will the coast Guard make it in time?   Or will the motorboat become another marine tragedy?

2. A massive snowstorm dumps two feet of snow on the city, and Winchester Public Schools are on schedule! Dr. Capehart, the school superintendent, drives 1989 yards on Amherst Street at a bearing of 30 degrees.   Then he hits ice and spins at a bearing of 470 degrees (technically, this is a bearing of 110 degrees).   His car goes out of control, and slides at that bearing for 200 yards, demolishing a school bus and a gas station in the process.   What is (a) the distance from his starting point to where he demolished the gas station, and (b) the bearing of the gas station from his starting point?

3. You see him across the room -- the man of your dreams.   You estimate that it would take you 12 steps at a bearing of 140 degrees and then 4 steps at a bearing of 220 degrees to reach him; however, this tall, dark, handsome stranger has caught your eye and you wish to run to him going the shortest way possible.   Find this distance and the bearing at which you must run.

4. Mr. Pleacher and Mr. Muller are out for a Sunday fly.   Their planes are 200 miles apart when they take off.   Mr. M travels 400 miles and Mr. P travels 300 miles when they collide.   Find the angle made by their paths when they collide (assume the two paths of the planes are straight lines).

5. You are riding your bike due North at 20 km/hr, but a wind from the west knocks you off your course by 24 degrees (in other words, you are really bicycling at a bearing of 24 degrees).   How fast is the wind blowing?

6. Jane walks 5 km at a bearing of 90 degrees and then goes 5 km at a 0 degree bearing. Find the magnitude and direction of her ending point from her starting point.

7. A car weighing 2,990 pounds is parked on a hill that makes an angle of 7 degrees 15 minutes with the horizontal.   What force tends to pull it down the hill?   Find the force exerted by the car against the hill.

8. The Jolly Green Giant stands 300 feet tall.   On New Years Eve, he got drunk and stood in the middle of Times Square swaying in the wind. If he sways 8 feet in each direction, what angle will his entire frame be with the ground?

9. A bus weighing 6075 pounds exerts a force of 5835 pounds on an inclined ramp. What angle does the ramp make with the horizontal?   What force must be exerted by the brakes to prevent the bus from rolling down the ramp?

10. Angie and Ted were out for their morning jog.   Angie, an outstanding athlete challenged Ted to a race.   They began at an oak tree (labeled point O in the diagram).   They began on opposite sides of the tree and ran for 6 seconds. Angie wound up 30 yards from the tree and Ted 50 yards.   If they were 70 yards apart at the end of the race, at what angle did they run from each other?