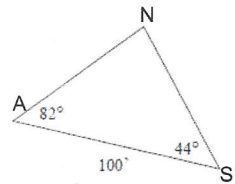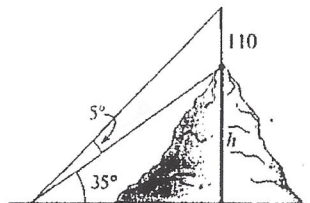**DO ALL WORK NEATLY, USING TRIG, ON A SEPARATE SHEET OF PAPER**

1. Using the diagram to the right, find the distance from Nick's house to Amy and Samantha's houses. Round your answer to the nearest foot.

2. A triangular lot faces two streets that meet at an angle of 85°. The sides of the lot facing the street are each 160 feet in length. Find the perimeter of the lot to the nearest foot.

3. A flagpole casts a shadow 40 feet long when the measure of the angle of the sun's rays with the ground is 32°. How tall is the flagpole? Round your answer to the nearest tenth.

4. A lighthouse 55 meters above sea level spots a distress signal from a sailboat. The angle of depression to the sailboat is 21°. How far away is the sailboat from the base of the lighthouse to the nearest meter? (Hint: The angle of depression is formed by the line of sight and a horizontal line).

5. Ben is flying a kite with 125 meters of sting out. His kite string makes an angle of 39° with the level ground. How high is his kite to the nearest meter? Assume that Ben is holding his kite string 2 meters from the ground.

6. It is believed that Galileo used the "Leaning Tower of Pisa" to conduct his experiments on the laws of gravity. When he dropped objects from the top of the 55 meter tower (measured length of tower, not height), they landed 4.8 meters from the base of the tower. To the nearest degree, what is the angle the tower leans from the vertical?

7. Igor's pet bat Natasha is flying at the end of a 50-foot leash which is anchored to the ground. Using an angle measuring device, Igor spots Natasha at an angle of 55° from the horizontal. To the nearest foot, how high is Natasha flying?

8. Meteorologist Wendy Storm is using an angle measuring device to determine the height of a weather balloon. When she views the balloon through the measuring device (which is sighted one meter above the level ground), she measures an angle of elevation to the device of 45°. The radio signal from the balloon tells her that the balloon is 1400 meters from her measuring device. To the nearest meter, how high is the balloon?

9. A plane is flying due West on a very clear day. He spots his house due West in front of him at an angle of depression of 35°. Further along he spots the airport at an angle of depression of 20°. If the ground distance between his house and the airport is 5.5 miles, how high is the plane flying? Round your answer to the nearest tenth of a mile.

10. A 110-foot antenna is on top of a hill. From a point on the ground, the angle of elevation to the bottom of the antenna is 35° and the angle of elevation to the top of the antenna is 40°. How high is the hill to the nearest tenth of a foot?

| 1. 86ft, 122ft | 2. 536ft | 3. 25ft | 4. 143m | 5. 81m |
| 6. 5 Deg | 7. 41ft | 8. 991m | 9. 4.2mi | 10. 554.5ft |