Solve each of the following problems. Show your complete solution, including an appropriate diagram, neatly organized in the space provided. All answers should be rounded to the nearest tenth.

1. A helicopter is flying 400 feet above level ground at a constant speed of 50 feet per second. What is the angle of elevation to the helicopter exactly 20 seconds after it flies directly overhead?

2. A guy wire goes from the top of a vertical pole to a point that is 100 feet from the base of the pole on level ground. If the wire makes an angle of 70 degrees with the ground, then how tall is the pole?

Solve each of the following problems. Show your complete solution, including an appropriate diagram, neatly organized in the space provided. All answers should be rounded to the nearest tenth.

3. A rectangle is 3 inches long and 2 inches wide. If a diagonal of the rectangle is drawn, then what is the angle between the diagonal and the short side of the rectangle?

4. A ladder that is 20 feet long leans up against a vertical wall. If the foot of the ladder is 8 feet from the wall on level ground, then what is the angle between the ladder and the ground?

Solve each of the following problems. Show your complete solution, including an appropriate diagram, neatly organized in the space provided. All answers should be rounded to the nearest tenth.

5. A ship leaves port at 10:00 AM and sails due east at 12 miles per hour. Two hours later, a second ship leaves the same port and sails due south at 15 miles per hour. If both ships maintain their speed and direction, then how far apart are the ships at 1:00 PM ?

6. A small airplane takes off on level ground with a constant speed of 100 feet per second. If its flight path makes an angle of 15 degrees with the level ground, then how high above the ground will it be ten seconds after 'lift off'?

Solve each of the following problems. Show your complete solution, including an appropriate diagram, neatly organized in the space provided. All answers should be rounded to the nearest tenth.

7. The shadow of a flag pole (on level ground) is 12 feet long when the angle of elevation to the sun is 73 degrees. How tall is the flag pole?

8. A ladder that is 30 feet long leans up against a vertical wall. If the ladder makes an angle of 75 degrees with the level ground, then how far up the wall does the ladder extend?