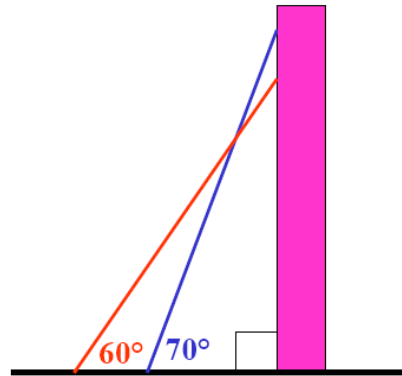**Name:** _____

Applications and Models

1) A 6 m ladder reaches higher up a wall when placed at a 70°angle than when placed at a 60°angle. How much higher, to the nearest tenth of a meter?

2) When the sun's angle of elevation is 57°, a building casts a shadow 21 m long. How high is the building?

3) A kite is flying at an angle of elevation of about 40°. All 80 m of string have been let out. Ignoring the sag in the string, find the height of the kite to the nearest 10m.

4) An observer located 3 km from a rocket launch site sees a rocket at an angle of elevation of 38°. How high is the rocket at that moment?

5) Martha is 180 cm tall and her daughter Heidi is 90 cm tall. Who casts the longer shadow, Martha when the sun is 70°above the horizon, or Heidi when the sun is 35°above the horizon? How much longer?

6) Scientists can estimate the depth of the craters on the surface of the moon by studying the lengths of the shadows in the craters. Shadows' lengths can be estimated by measuring them on photographs. Find the depth of a crater if the shadow is estimated to be 400 m long and the angle of elevation of the sun is 48°.