You throw a tangerine southward off the astronomy observation deck of the Mars Center with an initial velocity of 30 m/s and at an angle of 60° with the horizontal.

The deck is approximately 20 meters above ground.

1. How long is the tangerine in the air? How far from the Mars Center will it travel?

2. How does your answer change if the angle is 45°?

3. How does your answer change if the angle is 40°?

4. How would you go about finding the angle that maximizes the horizontal distance traveled?