

7. A tapered piece of pipe has a diameter of 3 inches at the small end, and is 7 inches long. The taper is 3° . Find the diameter at the large end.
8. A road sign indicates that the grade of a mountain road is 20% for the next 3 miles. (This means that the slope of the mountain is about 11.3° for those 3 miles). Find the change in elevation of a car going down this road.
9. A ski slope has an angle of elevation of 28° . The top of the slope is marked with a sign reading *Elevation 3200 feet*, and the bottom of the ski slope is marked as *Elevation 600 feet*. How long is the ski slope from top to bottom?

10. Suppose we see an airplane approaching us. When we first see it, the angle of elevation to the plane is 20° degrees, and one minute later, the angle of elevation is 60° . Assume the plane is flying at 570 mph, the typical cruising speed of a Boeing 747. How high is the plane?
11. A plane leaves a runway and climbs at angle of 15° at 175 mph.
- (a) What is the plane's altitude after 2 minutes?
- (b) How long will it take the plane to climb to 10000 feet?
12. The earth is roughly shaped like a sphere with radius 3890 miles. Syracuse is about 275 miles north of Annapolis. The latitude of Syracuse is $42^\circ 08'$. What is the latitude of Annapolis?