

Draw Diagrams. Show work. Round off all answers to one decimal place. (3 marks each)

- 1.) The angle of elevation of the Rock Mountain fire-control tower from the top of Blue Mountain 3.0 km away (horizontal distance) is  $18^\circ$ . How much higher than Blue Mountain is the fire-control tower?
  
  
  
  
  
  
  
  
  
  
- 2.) The angle of elevation of the summit from the bottom of the second lift at Snow Bowl is  $33^\circ$ . If a skier rides 1000 km on this lift to the summit, what is the vertical distance between the bottom of the lift and the summit?
  
  
  
  
  
  
  
  
  
  
- 3.) The angle of depression of an aircraft carrier from an approaching airplane is  $52.2^\circ$ . If the plane is 700 km above level of the deck of the carrier, how far away is the carrier?
  
  
  
  
  
  
  
  
  
  
- 4.) The navigator on a bomber finds that the angle of depression of a target 4.00 km away is  $11.4^\circ$ . At what altitude is the plane flying?
  
  
  
  
  
  
  
  
  
  
- 5.) Billy's kite has a string 40 m long and is flying 27 m above his eye level. Find the angle of elevation of the kite.

6.) At an airport, cars drive down a ramp 96 m long to reach the lower level baggage-claim area 13 m below the main level. What angle does the ramp make with the ground at the lower level?

7.) A surveyor standing in a ravine finds the angle of elevation of the top of one side is  $15.13^\circ$ . If he is standing 14 m from the base of this side, how deep is the ravine?

8.) As an airplane flying north passes directly over a civil defense air watch unit, another unit 4.30 km due north finds the angle of elevation of the plane to be  $19.17^\circ$ . Find the altitude of the plane.

9.) Find the length of the altitude of an isosceles triangle whose base has length 20.0 cm and whose base angles each has a measure of  $45^\circ$ .

10.) A pendulum 40 cm long is moved  $30^\circ$  from the vertical. How much is the lower end of the pendulum lifted?

- 11.) The top of a vertical tree broken by the wind hits the ground 25.0 m from the foot of the tree. If the upper portion makes an angle of  $30^\circ$  with the horizontal ground, what was the original height of the tree?
- 12.) The angle of depression of the top of Billings Building from the roof of the Wolcott Building (in the same vertical plane) is  $33.10^\circ$ , and from the 15<sup>th</sup> floor it is  $21.50^\circ$ . If the distance between the roof and the 15<sup>th</sup> floor is 101 m, how far apart are the buildings?
- 13.) From a point on the ground 75 m from the base of a building, the angle of elevation of the top of a flagpole on the edge of the roof of the building is  $45.20^\circ$  and the angle of elevation of the bottom of the flagpole is  $38.40^\circ$ . Find the height of the pole.
- 14.) How far from the vertical wall of a building is the base of a thirty-foot ladder, which makes a  $75^\circ$  angle with the ground?