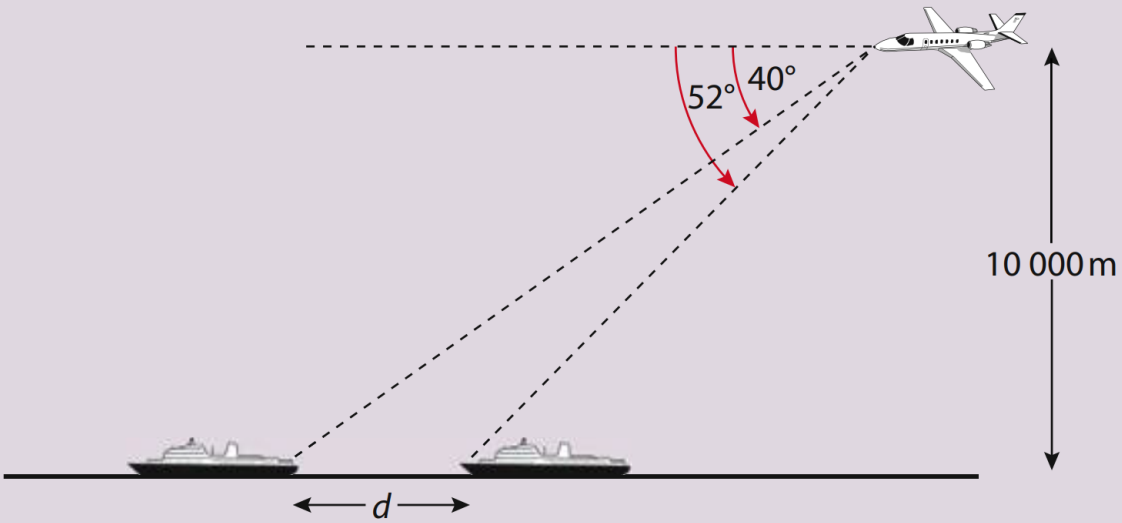
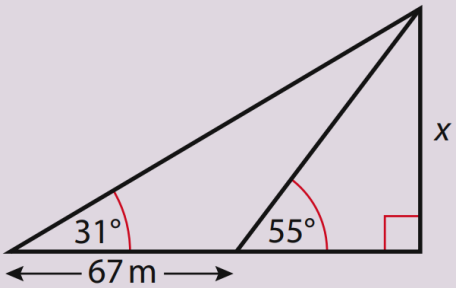
29 A pilot measures the angles of depression to two ships to be 40° and 52° (see the figure). If the pilot is flying at an elevation of 10 000 metres, find the distance between the two ships.



32 Find the length of x indicated in the diagram. Approximate your answer to 3 significant figures.



EXAMPLE 9.6 The angle of depression from the roof of building A to the foot of a second building, B, across the same street and 40 metres away is 65°. The angle of elevation of the roof of building B to the roof of building A is 35°. How tall is building B?

10. Two towns P and Q are 50 km apart, with P due west of Q. The bearing of a station from town P is 040°T while the bearing of the station from town Q is 300°T. How far is the station from town P?

12. A hiker walks for 5km on a bearing of 053° true (North 53° East). She then turns and walks for another 3km on a bearing of 107° true (East 17° South).

(a) Find the distance that the hiker travels North/South and the distance that she travels East/West on the first part of her hike.

(b) Find the distance that the hiker travels North/South and the distance that she travels East/West on the second part of her hike.

(c) Hence find the total distance that the hiker travels North/South and the distance that she travels East/West on her hike.

(d) If the hiker intends to return directly to the point at which she started her hike, on what bearing should she walk and how far will she have to walk?

EXAM-STYLE QUESTION

7 A ship leaves port and sails 35 km on a bearing of 047°. The ship then turns and sails 15 km on a bearing of 105°. How far, and on what bearing, must the ship sail to return directly to port?

8 Buildings X and Y are across the street from each other, 95 m apart. From a point on the roof of Building X, the angle of depression to the base of Building Y is 55° and the angle of elevation to the top of Building Y is 35°. How tall are the two buildings?

9 Jacob is walking north along a straight road when he spots a tower in a field to his right on a bearing of 018°. After walking another 240 metres he notices the tower is now on a bearing of 066°. If he continues walking north, how close will he pass to the tower?

10 From her position at ground level, Hayley notices that the angle of elevation of the top of a building is 40°. When she moves 20 metres closer to the building, the new angle of elevation is 55°. Find the height of the building.

11 A car is traveling at a constant speed on a straight highway. A passenger in the car sees a bridge spanning the highway ahead at an angle of elevation of 5°. Ten seconds later, the angle of elevation of the bridge is 17°. How much more time will elapse before the car passes directly under the bridge?