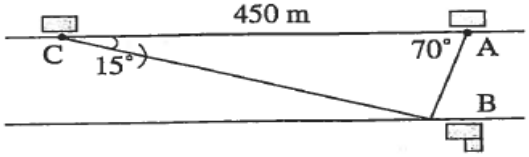
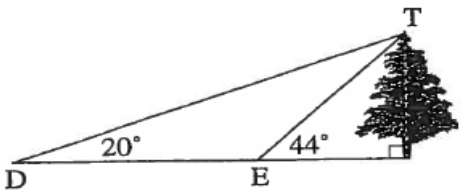
10. Two cabins, A and C, are located 450 m apart on the bank of a river (below left). Across the river from the two cabins is a boathouse B. Calculate the width of the river.



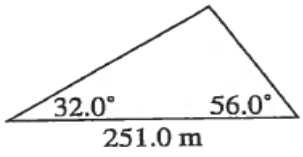


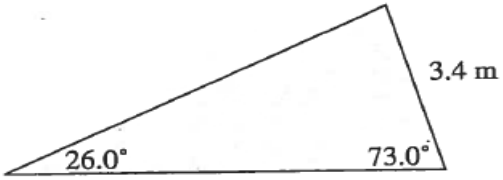
11. The diagram (above right) represents points D and E from which the lines of sight to the top of a tree at T make angles of 20° and 44°, respectively, with DE. The length of DE is 62.0 m. Calculate the height of the tree.

12. The diagram (below left) represents a triangular park measuring 251.0 m along one side. The other two sides form angles of 32.0° and 56.0° with the first side.

a) Determine the lengths of the other two sides.

b) Calculate the area of the park.

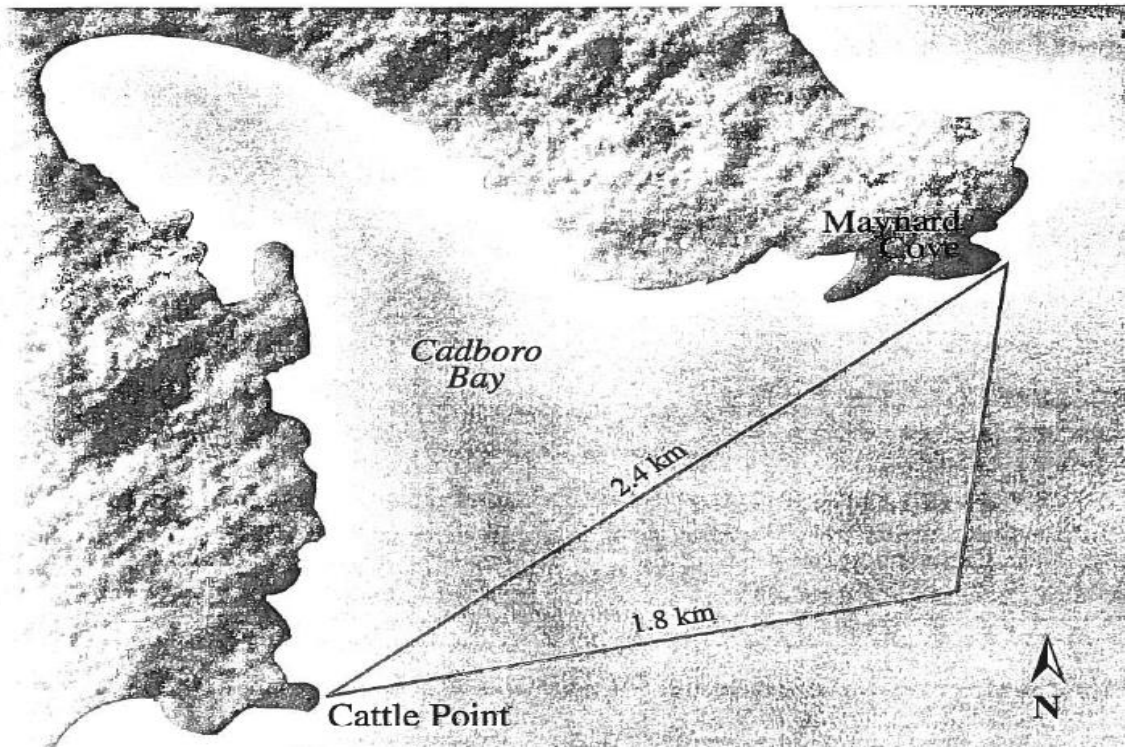




15. Cattle Point is part of Victoria, B.C. Maynard Cove is 2.4 km from Cattle Point on a bearing of 053°. A sailboat leaves Cattle Point on a bearing of 079°. After sailing for 1.8 km, the boat turns and heads directly to Maynard Cove on a bearing of 008°.

a) What is the bearing of Cattle Point from Maynard Cove?

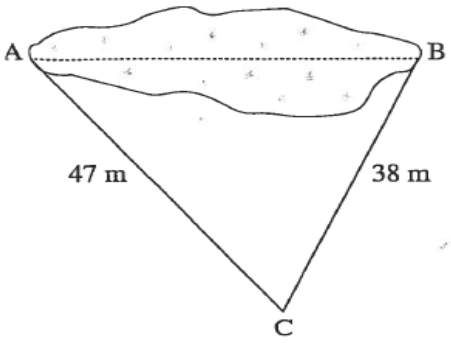
b) Calculate the total distance the boat travels to get to Maynard Cove.

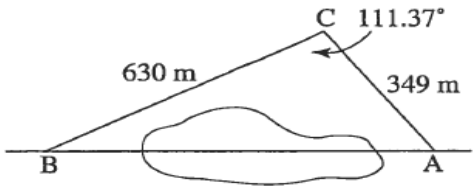


5.5.1 pp.62-64

10) 110 m
12a) 208.2 m, 133.1 m
15a) 233°
11) 36.2 m
b) 13 848 m^2
b) 2.9 km

5. To determine the distance AB across a marsh, a surveyor locates a point C (below left). The measure of ∠C is 65°, and the lengths are as given in the diagram. How far is it across the marsh?





6. An electric transmission line is to go over a pond (above right). The power line will be supported by posts at points A and B. A surveyor measures the distance BC as 630 m, the distance AC as 349 m, and ∠BCA as 111.37°. What is the distance between the posts at A and B?

18. From a certain point, the angle of elevation to the top of a church steeple is 10°. At a point 100 m closer to the steeple, the angle of elevation is 20°. Calculate the height of the steeple.

19. The highest waterfall in Canada is Della Falls on Vancouver Island. From a certain point, the angle of elevation to the top of the falls is 58°. At a point 41 m closer to the falls, the angle of elevation is 62°. Calculate the height of Della Falls.

20. A helicopter hovers directly above the landing pad on top of a 125-m high building. A person is standing 145 m from the base of the building. The angle of elevation to the helicopter from this person is 58°. How high is the helicopter above the landing pad?

21. A triangular park has sides of length 200 m, 155 m, and 172 m. Calculate the area of the park.

22. A farmer has a field in the shape of a triangle. From one vertex, it is 435 m to the second vertex and 656 m to the third vertex. The angle between the lines of sight to the second and third vertices is 49°. Calculate the perimeter and the area of the field.

23. A market gardener has to fertilize a triangular field with sides of lengths 90 m, 45 m, and 65 m. The fertilizer is to be spread so that 1 kg covers 10 m^2. One bag of fertilizer has a mass of 9.1 kg. How many bags of fertilizer will be needed?

24. A radar tracking station locates a fishing trawler at a distance of 5.4 km, and a passenger ferry at a distance of 7.2 km. At the station, the angle between the lines of sight to the two ships is 118°. How far apart are the ships?

25. Two ships leave a port at the same time. One sails at 17 km/h on a bearing of 205°. The other sails at 21 km/h on a bearing of 243°. How far apart are the two ships after 2 h?

5.5.1 pp.70-72

5) 46 m 6) 824 m
18) 34 m 19) 440 m 20) 107 m
21) 12 900 m^2 22) 1 586 m, 107 608 m^2
23) 16 24) 10.8 km 25) 26 km