EXERCISES 4-1

In Exercises 1-8 find the asked-for part of $\triangle ABC$.

A

1. $a = 5; b = 8; \angle C = 60°; c = ?$
2. $b = 15; c = 7; \angle A = 60°; a = ?$
3. $b = 7; c = 8; \angle A = 120°; a = ?$
4. $a = 9; c = 15; \angle B = 120°; b = ?$
5. $a = 3; b = 8; c = 7; \angle C = ?$
6. $a = 5; b = 19; c = 16; \angle B = ?$
7. $a = 7; b = 14; c = 10; \angle B = ?$
8. $a = 5; b = 7; c = 9; \angle A = ?$

Find the lengths of the diagonals of a parallelogram having sides of the given lengths and an angle of the given measure.

9. 6 cm, 10 cm, 60°
10. 30 m, 40 m, 110°

Find the lengths of the sides of a parallelogram if its diagonals have the given lengths and intersect at the given angle.

11. 30 cm, 14 cm, 72°
12. 10 cm, 16 cm, 120°

In Exercises 13 and 14, find the angles of a parallelogram if its sides have lengths a and b and a diagonal has length d.

13. $a = 7$ m, $b = 8$ m, $d = 13$ m
14. $a = 5$ km, $b = 8$ km, $d = 7$ km
15. Solve Problem 1, page 125, assuming that the slower ship leaves port at 11 A.M.
16. The angle between the straight highways joining town A to towns B and C measures 60°. How far apart are B and C if their distances from A are 16 km and 21 km, respectively?
17. A triangular course for a 30 km yacht race has sides 7 km, 9 km, and 14 km long. Find the largest angle of the course.
18. A cruise ship and a freighter leave port at the same time and travel straight-line courses at 30 km/h and 10 km/h, respectively. Two hours later they are 50 km apart. Find the angle between their courses.

21. A baseball diamond is a 90-ft square. The mound is 60.5 ft from home plate. How far is it from the mound to first base?

In Exercises 32–35, the lengths of the sides of $\triangle ABC$ are given. Find the length of the median to side $\overline{AB}$.

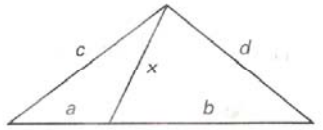
32. $a = 4; b = 8; c = 8$
33. $a = 20; b = 18; c = 18$
34. $a = 17; b = 19; c = 16$
35. $a = 10; b = 13; c = 16$

Exercises 36–39 refer to $\triangle ABC$ for which b, c, and $\angle B$ or $\cos B$ are given. Find a. There may be two answers.

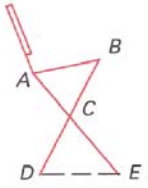
36. $b = 7; c = 3; \angle B = 120°$
37. $b = 7; c = 8; \angle B = 60°$
38. $b = 2; c = 4; \cos B = 0.875$
39. $b = 7; c = 5; \cos B = 0.2$

Exercises 40–43 refer to the figure at the right. Lengths a, b, c, and d are given. Find x in simplest radical form.

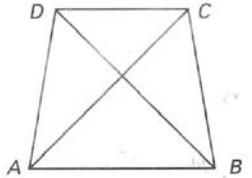
40. $a = 2; b = 6; c = 5; d = 9$
41. $a = 4; b = 21; c = 15; d = 20$
42. $a = 3; b = 2; c = 6; d = 4$
43. $a = 3; b = 6; c = 7; d = 11$



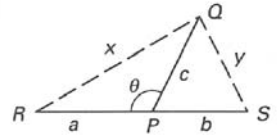
44. Shown below is a folding chair in which $DC = 20$ cm, $EC = 25$ cm, $CA = 16$ cm, and $CB = 20$ cm. If $DE = 30$ cm, find AB.



Exercise 44



Exercise 45



Exercise 46

45. A trapezoidal section of a steel tower is shown above. In it, $AB = 7$ m, $DC = 5$ m, $AD = BC = 6$ m. Find AC.