

## 1.4 Book work

### EXERCISES 1-4

In Exercises 1–12,  $\angle C = 90^\circ$ . Solve  $\triangle ACB$ .

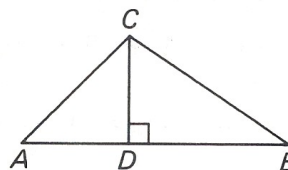
- A**
- |   |   |
|---|---|
| 1. $c = 252$ ; $\angle A = 31.5^\circ$    | 2. $c = 42.6$ ; $\angle A = 58^\circ 20'$ |
| 3. $a = 35.6$ ; $\angle B = 64^\circ 40'$ | 4. $b = 305$ ; $\angle A = 38.6^\circ$    |
| 5. $a = 0.47$ ; $\angle A = 72^\circ$     | 6. $b = 0.26$ ; $\angle B = 41^\circ$     |
| 7. $a = 3.60$ ; $b = 2.50$                | 8. $a = 52.0$ ; $b = 38.0$                |
| 9. $b = 46.0$ ; $c = 63.0$                | 10. $b = 3.20$ ; $c = 5.50$               |

In Exercises 11 and 12, give exact values of measures.

- |                                       |  |
|---------------------------------------|--|
| 11. $b = 3\sqrt{3}$ ; $c = 3\sqrt{6}$ | 12. $a = 5\sqrt{6}$ ; $c = 10\sqrt{2}$ |
|---------------------------------------|--|

In Exercises 13–16, solve isosceles  $\triangle ABC$ , having  $\overline{AB}$  as base.

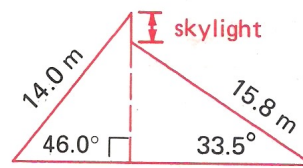
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|--|--|
| 13. $a = 27$ ; $\angle A = 43^\circ$     | 14. $a = 14$ ; $c = 22$                  |
| 15. $a = 16.8$ ; $\angle C = 76.4^\circ$ | 16. $c = 47.6$ ; $\angle C = 52.4^\circ$ |
17. Find  $\angle B$  in the figure if  $\angle A = 52^\circ 40'$ ,  $AD = 38.1$ , and  $BC = 70.0$ .
18. Find  $\angle A$  in the figure if  $\angle B = 37.2^\circ$ ,  $BC = 17.8$ , and  $AD = 11.2$ .



Exercises 17–18

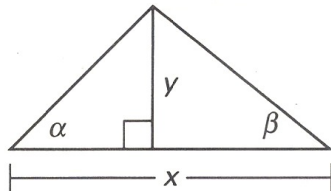
19. What is the angle of elevation of the sun when a pole 32.0 feet tall casts a shadow 45.0 feet long?
20. The levels in a parking garage are 12.5 feet apart, and a ramp from one level to the next level is 138 feet long. What angle does the ramp make with the horizontal?
21. A vertically-directed searchlight shines a spot of light on the bottom of the cloud cover over an airport. The angle of elevation of the spot from an observation post 975 m from the searchlight is  $63.5^\circ$ . How high is the cloud cover?
22. In one minute a plane descending at a constant angle of depression of  $12.4^\circ$  travels 1600 m along its line of flight. How much altitude has it lost?
23. A beam bracing a wall makes an angle of  $59^\circ$  with the ground and reaches 18 feet up the wall. How long is the beam?
24. A ladder leans against a wall and makes an angle of  $65^\circ 10'$  with the ground. How long is the ladder if its foot is 2.10 m from the bottom of the wall?

- B** 25. The figure gives the cross-sectional plan for a roof. Given the specifications shown, find the height allowed for the skylight.

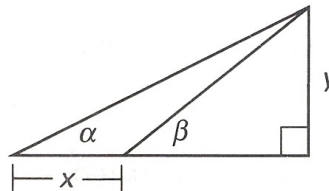


In Exercises 37 and 38, express  $x$  in terms of  $\alpha$ ,  $\beta$ , and  $y$ .

37.



38.



39. Kim and Luis are in line with a 50-foot flagpole but on opposite sides of it. The angles of elevation of the top of the pole from their positions are  $45^\circ$  and  $33^\circ$ . How far apart are they? (See Exercise 37.)
40. Two planes flying at 4500 m above sea level are directly east of a control tower 1200 m above sea level. How far apart are the planes if their angles of elevation from the tower are  $21.2^\circ$  and  $39.6^\circ$ ?

27. The arms of a compass are each 12.5 cm long and their ends are 6.50 cm apart. Find the angle between them.

43. A plane is in line with a 1200 m landing strip. The pilot measures the angles of depression of the ends of the strip to be  $15.8^\circ$  and  $11.5^\circ$ . How high up is the plane and how far is it horizontally from the nearer end of the strip?