12. A ladder 40 ft. long leans against a wall with its lower end 8.5 ft. from the wall. Find the inclination of the ladder to the horizontal.
13. A triangle has sides 20.0 in., 20.0 in., 16.9 in. long. Find the size of the smallest angle.
14. In the triangle PQR, $P = 90°$, $q = 12.5$ in., $r = 17.5$ in. Find $\angle Q$.
15. Find the angle of elevation of the sun when a vertical pole 6 ft. 8 in. high has a shadow 4 ft. 6 in. long on horizontal ground.
16. An isosceles triangle has equal legs l units long, and a base angle X. Express the altitude of the triangle and the base of the triangle in terms of l and $\angle X$.
17. One leg of a right triangle is $\frac{2}{3}$ the length of the hypotenuse. Find the larger acute angle of the triangle.
18. Find the angles of a triangle which has sides in the ratio 3 : 3 : 4.

Exercises [A-2]

1. Use tables to find sin 53° 42′, tan 15° 12′, cos 35° 50′, tan 54° 10′.
2. Find the size of $\angle X$ when (**a**) $\tan X = 2.0323$, (**b**) $\tan X = 0.3000$, (**c**) $\cos X = 0.4011$.
3. Find tan 63° 50′, tan 46° 16′, cos 15° 33′, sin 71° 45′.
4. Find to the nearest minute the angles which have the following tangents: 1.4000, 0.6240, 2.4200.
5. Find the size of $\angle X$ if $\tan X = \frac{1}{2} \tan 60°$.
6. In the triangle ABC, $C = 90°$, $B = 29° 20'$, $b = 25.0$ ft. Find a.
7. In the triangle ABC, $C = 90°$, $A = 38° 42'$, $c = 10.0$ in. Find b.
8. In the triangle XYZ, $Z = 90°$, $x = 6.24$ in., $z = 12.0$ in. Find $\angle Y$.
9. The angle of elevation of a small cloud C, measured at a point A on the ground, is 82° 15′. The cloud is vertically over point B, which is on the ground 600 ft. from A. Find, to two significant figures, the height of the cloud.
10. Find the smaller acute angle of a right triangle which has hypotenuse 12.0 in. and one leg 7.80 in.
11. An isosceles triangle has legs 15.0 in. long, and the angle formed by the legs is 45°. Find the length of the base.
12. A lookout point on a lighthouse is 250 ft. above the level of the water. From this point the angle of depression of a floating object is 14° 20′. Find the horizontal distance of the object from the lighthouse.

13. The legs of a right triangle are 6.00 in. and 9.00 in. long. Find the smallest angle of the triangle.
14. The triangle XYZ has a right angle at Z. Express (a) y in terms of z and $\angle X$, (b) x in terms of z and $\angle X$, (c) y in terms of x and $\angle X$.
15. A roof is to rise 10 ft. 0 in. in a horizontal distance of 15 ft. 6 in. Find the inclination of the roof to the horizontal.
16. The triangle ABC has $C = 90°$, $c = 2500$ ft., $B = 27° 15'$. Find a.
17. A right triangle has hypotenuse k units and an acute angle A. Express the lengths of the legs in terms of k and $\angle A$.
18. Find $\angle A$ if $\tan A = 2 \tan 45°$.
19. A staircase is to rise 10 ft. 8 in. in a horizontal distance of 13 ft. 4 in. Find the inclination of the handrail to the horizontal.
20. The horizontal distance between two towers is 120 ft. From the top of the taller tower, which is 96.5 ft. high, the angle of depression of the top of the other tower is 15° 20′. Find the height of the shorter tower to three significant figures.

Pages 255-256

1. 0.8059; 0.2717; 0.8108; 1.3848.
2. a. 63°48'. b. 16°42'. c. 66°21'.
3. 2.0352; 1.0453; 0.9634; 0.9497.
4. 54°28'; 31°58'; 67°33'.
5. 40°54'
6. a = 44.5 ft.
7. b = 7.80 in.
8. Y = 58°40'
9. 4400 ft.
10. 40°33'
11. 11.5 in.
12. 980 ft.
13. 33°41'
14. a. $y = z \cos X$
    b. $x = z \sin X$
    c. $y = \frac{x}{\tan X}$
15. 32°50'
16. a = 2222 ft.
17. k sin A units; k cos A units
18. 63°26'
19. 38°40'
20. 63.6 ft.