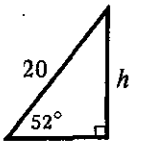
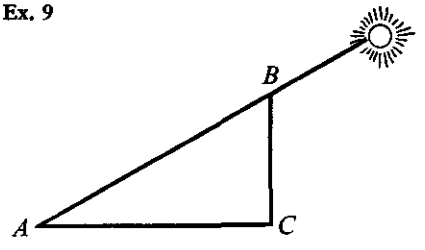
Exercises [A]

1. In $\triangle ABC$, $\angle C = 90°$, $b = 10$ in., $\angle A = 31°$. Find a.
2. A ladder 20 ft. long leans against a vertical wall and makes an angle of 52° with the horizontal. How high up the wall does the ladder reach?

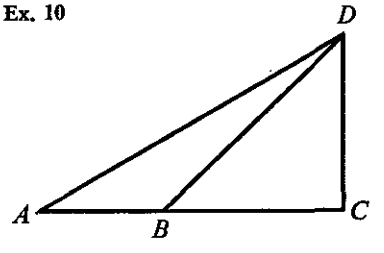


3. One angle of a right triangle contains 34° and the hypotenuse is 10 in. long. Find the lengths of the other two sides of the triangle.
4. A road inclines upwards at an angle of 16° to the horizontal. How far does a man ascend vertically in walking 350 ft. along the road?
5. The length of a kite string is 250 ft. and it makes an angle of 70° with the ground. How high is the kite above the hand of the person holding the string if the string is stretched straight?
6. The diagonal of a square is 16 in. long. How long is one side?
7. At 1:00 P.M. a plane was directly overhead. Ten seconds later the angle of elevation of the plane was 45°. If the plane was 5000 ft. high, how fast was it flying?
8. A 20-foot ladder makes an angle of 26° with a house. How far from the house is the bottom of the ladder?
9. At a certain hour the post, BC, casts a shadow AC. If BC is 6 ft. long and AC is 10.4 ft., what is the angle of elevation, $\angle CAB$, of the sun? (Answer to the nearest degree.)

Ex. 9



Ex. 10

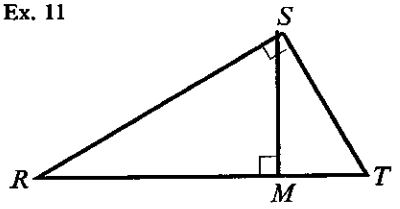


10. John, at A, finds the angle of elevation of D to be 30°. Peter, at B, finds the angle of elevation of D to be 44°. The distance AB is 120 ft.; $DC = h$ ft.
    (a) Find the length of BC to the nearest foot.
    (b) Find the length of DC to the nearest foot.
    (c) How many degrees in $\angle ABD$?
    (d) How many degrees in $\angle ADB$?
    (e) Find the length of AD to the nearest foot.

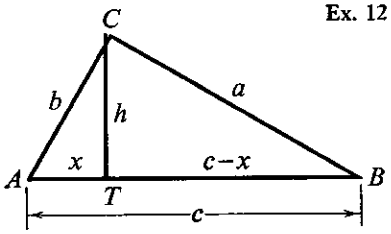
11. $RS = 5$ in., $\angle RMS = 90°$, $SM = 2\frac{1}{2}$ in., $\angle RST = 90°$.

Find: (a) $\angle R$ (d) MT
(b) RM (e) ST
(c) $\angle T$ (f) the area of $\triangle RST$

Ex. 11



Ex. 12



12. In the figure at the right above, $\angle ACB = 90°$, $CT \perp AB$.

(a) Find h in terms of a, b, c.

(b) Find x in terms of b and c.

(c) If we let K stand for the area of $\triangle ABC$, then $K = \frac{1}{2}ch$. Show that $K = \frac{1}{2}bc \sin A$.

(d) Using the relations $x = b \cos A$ and $c - x = a \cos B$, show that $c = b \cos A + a \cos B$.

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1. 6.0 in.
2. 15.8 ft.
3. 5.6 in., 8.3 in.
4. 96.5 ft.
5. 234.9 ft.
6. 11.3 in.
7. $340\frac{10}{11}$ m.p.h.
8. 8.8 ft.
9. 30°
10. a. 178 ft.
    b. 172 ft.
    c. 136°
    d. 14°
    e. 345 ft.
11. a. 30°
    b. 4.3 in.
    c. 60°
    d. 1.4 in.
    e. 2.9 in.
    f. 7.2 sq.in.
12. a. $h = \frac{1}{2c}\sqrt{4a^2b^2 - (c^2 + b^2 - a^2)^2}$
    b. $x = b^2/c$