

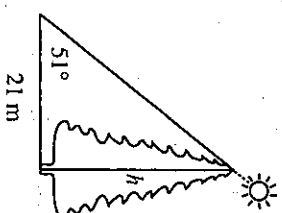
Applications of Trigonometry

For use after Section 8-7

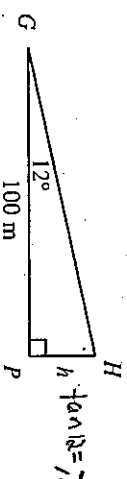
In Exercises 1-5 express lengths correct to the nearest meter and angles correct to the nearest degree. Use a scientific calculator or the table on page 311 of the text.

SCENARIO

1. A tree casts a shadow 21 m long. The angle of elevation of the sun is 51° . What is the height of the tree? 21.6 m
2. A helicopter (H) is hovering over a landing pad (P) 100 m from where you are standing (G). The helicopter's angle of elevation with the ground is 12° . What is the altitude of the helicopter? 21 m

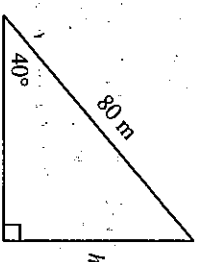


$$\tan 51 = \frac{h}{21}$$



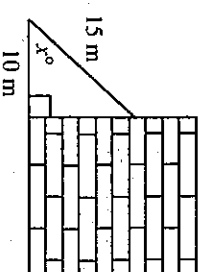
$$\tan 12 = \frac{h}{100}$$

3. You are flying a kite and have let out 80 m of string. The kite's angle of elevation with the ground is 40° . If the string is stretched straight, how high is the kite above the ground? 51 m



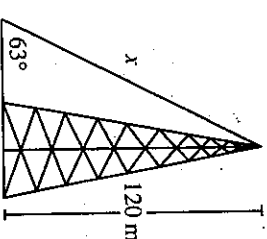
$$\sin 40 = \frac{h}{80}$$

4. A 15 m pole is leaning against a wall. The foot of the pole is 10 m from the wall. Find the angle the pole makes with the ground. 48°



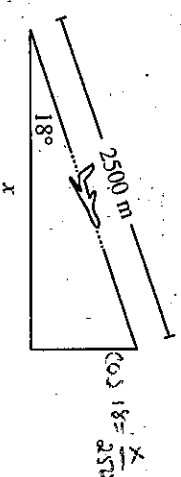
$$\cos x = \frac{10}{15}$$

5. A guy wire reaches from the top of a 120 m television transmitter tower to the ground. The wire makes a 63° angle with the ground. Find the length of the guy wire. 135 m



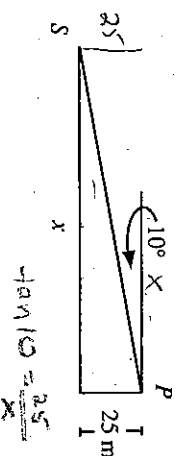
$$\sin 63 = \frac{120}{x}$$

6. An airplane climbs at an angle of 18° with the ground. Find the ground distance the plane travels as it moves 2500 m through the air. Give your answer to the nearest 100 m. 2376 ft



$$\cos 18 = \frac{x}{2500}$$

7. A lighthouse operator at point P 25 m above sea level sights a sailboat at point S . The angle of depression of the sighting is 10° . How far is the boat from the base of the lighthouse? Give your answer to the nearest 10 m. 142 m



$$\tan 10 = \frac{25}{x}$$