

1. A ladder is 8 metres long. It is leaning against the wall of a house and reaches 6 metres up the wall. Calculate the angle which the ladder must make with the level ground.
2. A kite-string has a total length of 75 metres. Calculate the height at which the kite must be flying when the string is fully out and is making an angle 37 degrees with the level ground.
3. The longest edge of an oblong measures 8 cm and its diagonal is 10 cm. What is the angle formed between the diagonal and the longest edge?
4. A television mast is stayed by a single wire cable which is 60 metres long. The stay is fastened to the top of the mast and to the ground. It makes an angle of 58° with ground. Find the height of the mast.
5. A slipway for a lifeboat is 50 metres long and is inclined at an angle of 35° to the horizontal. What is the height of the floor of the boathouse above the level of the sea?
6. The longest edge of a 30/60 set-square is 18 cm long. Calculate the length of its shortest edge.
7. The ribbons of a maypole are 10 metres long. During the course of a dance the dancers are moving in a circle around the pole and about 3.5 metres away from it. What then is the angle between the ribbons and the ground?
8. Measured on a map, the distance between the tops of two hills is 570 metres. The angle of elevation from the top of the smaller of the two hills, to the the top of the taller one is 27° . The tops of these hills are to be joined by a cable on which a ski-lift will run. What length of cable will be needed?
9. An isosceles triangle has two equal edges of length 8 cm. Its two equal angles measure 15.3° . What is the length of its other edge?
10. One section of a mountain-railway is 550 metres long. In that length it rises through a vertical height of 140 metres. Calculate the overall average angle of inclination of the track.
11. A 12 metre ladder is leaning against a wall. The foot of the ladder is 3.5 metres away from the base of the wall. What is the size of the angle which ladder makes with the ground?
12. An isosceles triangle has two edges of length 11 cm and one of length 8 cm. Find the sizes of all its angles.
13. A drilling-platform for an oil-rig is moored in the sea at a point where it is 130 metres deep. The average angle of the anchor cable with the horizontal is 28° . What length of cable is needed?
14. A house is sited just 150 metres from a straight section of road. The path to the house is straight, but is inclined at an angle of 54 degrees to the road. What is the length of the path?
15. The diagonal of an oblong is 15 cm long and makes an angle of 56° with one of its edges. Calculate the size of the oblong.
16. A vertical tent-pole is kept upright by ropes of length 4 metres tied to the top of the pole and to pegs in the ground. These ropes make an angle of 43° with the ground. What is the height of the tent-pole?
17. A telegraph-pole is supported by a stay-wire which is fastened to a point halfway up the pole. The stay-wire is 8 metres long and makes an angle of 56° with ground. Find the height of the pole.
18. A kite-string is 48 metres long. During one 'flight', when the wind strengthened, the angle between the kite-string and the ground was seen to double in size from 27° to 54° . What was the resulting increase in the vertical height of the kite above the ground?
19. A rhombus has edge-lengths of 7 cm. Its acute interior vertex angles are both 70° . Calculate the lengths of both of its diagonals.
(The diagonals of a rhombus bisect each other and cross at right angles.)
20. A rod 1 metre long is hanging on a wall. If the bottom end of the rod is pulled out 20 centimetres from the wall, what angle will the rod make with the wall?
21. An 8 metre ladder leaning against a wall makes an angle of 63° with the ground. How far is the foot of the ladder away from the wall?
22. A parallelogram has edge-lengths of 5 cm and 9 cm respectively, and an angle of 58° between them. Calculate the perpendicular distance between the two longer edges.
23. A pair of railway-lines are 143.5 cm apart. On one particular curved section the 'banking' is formed by raising the outer rail 8 cm above the level of the inner rail. When a train is being driven around this curve, by how much does it lean out of the vertical?
24. The legs of a camera tripod are each 130 cm long. The tripod is set up on a piece of level ground so that each leg makes an angle of 70° with the ground. What is the vertical height of the top of the tripod above the ground?
25. A path going up a cliff-face from the bottom to the top is 700 metres long. Its overall average inclination to the horizontal is 15° . What is the height of the cliff-face?