

Problem Solving



Name:

Date:

Pythagoras, Trigonometry, Congruence & Similarity

Romeo looks up at Juliet from below her balcony. The balcony is 10 metres high, and Romeo is 3 metres away from the base of the tower. What is the angle of elevation?

1

Bill is trying to get on top of his shed, which is 8 metres tall. He has a ladder that is 10 metres long, but for safety reasons, the feet of the ladder must be at least 3 metres away from the base of the shed when in use. Is the ladder tall enough to reach the roof of the shed?

3

A hunter is on the edge of a hill, 40 metres above a valley. His rifle has an effective range of 500 metres. What is the maximum distance from the base of the hill that he can hit? What is the angle of depression of this shot?

4

Mark is challenging his friend Jim to a race. They must race from one corner of an 80 m square field to the other. As the faster runner, Jim will run around the edge of the field, while Mark can run through the middle of the field. How much farther must Jim run than Mark?

2

Rachel is given a 1 metre ruler and asked to estimate the height of a tree. She places the ruler vertically so that the ruler's shadow ends at exactly the same point as that of the palm tree. The ruler's shadow is 3 metres long, and the tree's shadow is 18 metres long. How high is the palm tree?

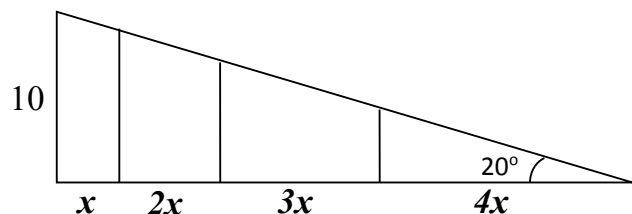
5

Sarah is peering over the sheer side of the cliff of a mountain 350 metres high. She's terrified and doesn't think she'll be able to take the zipline down. Her friend Britney is at the base of the mountain, 220 metres from the base of the cliff, waiting patiently. What is the angle of depression from Sarah to Britney? How long is the zipline?

7

A ramp for a theme park is built with multiple support posts. Each support post is spaced closer to the tallest end. How high is each of these posts? How many units of material will be needed for the entire ramp?

(round to the nearest unit)



6

The top of a kitchen table measures 160cm by 90cm. A beetle scuttles diagonally across the table. How far does it walk?

8

A 40 inch television is 25 inches wide. What is the height of the screen?

9

George is hang gliding off the top of a peak, 400 metres above water level. He slowly loses height as he travels, making an angle of depression of 8° from his starting point. How far from the base of the peak can he travel before he reaches the water?

10

A rectangular park is 190 metres by 310 metres. John exercises each day by running 4 laps around the edge of the park. Due to heavy rain, two adjacent sides are too muddy to run along, so John runs in a triangular path along the two dry sides and diagonally between them. He does 5 laps of this circuit. How much more or less does he run than normal?

12

11

Two buildings, 15m and 35m high are directly opposite each other on either side a 5m wide street. What is the distance between the top of the two buildings?

13

Find the perimeter and area of an equilateral triangle whose perpendicular height is 6cm.

Annie is flying a kite with 80 metres of line. It is casting a shadow over a family 25 metres away. Assuming that the sun is directly overhead, how far off the ground is the kite?

14

Mary is trying to find out how tall her apartment building is. From where she started, the top of the building is at a 30 degree angle to the ground. After walking 10 metres closer, the top of the building is now at a 45 degree angle. How tall is the building?

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A spider is climbing along a cube 2cm wide. What is the shortest distance for it to travel from one corner to the opposite corner?

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