Practical length problems

6 questions | 14 marks

Equivalent correct methods earn the corresponding marks.

1. A rectangular screen is 12 cm by 16 cm. Find its diagonal. [2 marks]

$d^2 = 144 + 256 = 400$.

Take the positive root.

Answer: 20 cm.

2. A 17 m ladder has its foot 8 m from a perpendicular wall. Find the height reached. [2 marks]

$h^2 = 289 - 64 = 225$.

The positive root is 15.

Answer: 15 m.

3. A cable runs from the top of a 12 m pole to a point 5 m horizontally from its base. Find the taut cable length. [2 marks]

Model a right triangle with legs 12 and 5.

$c^2 = 144 + 25 = 169$.

Answer: 13 m.

4. A 25 m wire reaches a pole top 24 m above level ground. Find the horizontal distance of its ground anchor from the pole. [2 marks]

$x^2 = 625 - 576 = 49$.

Take the root.

Answer: 7 m.

5. A 15 m ladder moves from a foot distance of 9 m to a foot distance of 12 m from a wall. Find the vertical drop of its top. [3 marks]

Initial height: $\sqrt{225 - 81} = 12$ m.

Final height: $\sqrt{225 - 144} = 9$ m; subtract.

Answer: 3 m.

6. A 6 m by 8 m rectangular garden has a diagonal path. How much shorter is that path than walking along one 6 m side and one 8 m side? [3 marks]

The diagonal is $\sqrt{36 + 64} = 10$ m.

The two sides total 14 m; subtract 10.

Answer: 4 m shorter.