Pythagoras (applied): 10 practice questions

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Name: _____ Date: _____

Attempt all questions and show your working. Suggested time: 15 to 20 minutes.

Section A: Consolidating (Questions 1-4)

Question 1

A right-angled triangle has shorter sides of 9 cm and 12 cm. Find the length of the hypotenuse.

Question 2

In $\triangle$ ABC, the right angle is at C and angle A = θ. Name the side that is:

(a) the hypotenuse

(b) opposite θ

(c) adjacent to θ

Question 3

A right-angled triangle has sides of 3, 4 and 5. For the angle θ, the opposite side is 3 and the adjacent side is 4. Write the values of sinθ, cosθ and tanθ as fractions.

Question 4

A map has a scale of 1 : 50,000. Two towns are 4 cm apart on the map. How far apart are they in real life, in kilometres?

Section B: Standard (Questions 5-10)

Question 5

A right-angled triangle has a hypotenuse of 26 cm and one shorter side of 10 cm. Find the length of the other side.

Question 6

In a right-angled triangle, one angle is 35° and the hypotenuse is 20 cm. Find the length of the side opposite the 35° angle, correct to two decimal places.

Question 7

In a right-angled triangle, the side opposite angle θ is 7 cm and the side adjacent to θ is 10 cm. Find θ, correct to one decimal place.

Question 8

A 5 m ladder leans against a vertical wall on level ground. The foot of the ladder is 1.4 m from the wall.

(a) How high up the wall does the ladder reach?

(b) Find the angle the ladder makes with the ground, correct to one decimal place.

Question 9

A triangle has sides of 20 cm, 21 cm and 29 cm. Use Pythagoras' theorem to decide whether it is a right-angled triangle. Show your working.

Question 10

At the same time of day, a person 1.6 m tall casts a shadow 2 m long, and a tree casts a shadow 15 m long.

(a) Explain why the two triangles formed (object, shadow and sun ray) are similar.

(b) Find the height of the tree.

Pythagoras (applied): answers

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Question 1

Answer: 15 cm (√(81 + 144) = √(225))

Question 2

Answer: (a) AB (b) BC (c) AC

Question 3

Answer: sinθ = ⅗, cosθ = ⅘, tanθ = ¾

Question 4

Answer: 2 km (4 × 50,000 = 200,000 cm)

Question 5

Answer: 24 cm (√(676 - 100) = √(576))

Question 6

Answer: 11.47 cm (20 sin 35°)

Question 7

Answer: 35.0° ($\tan^{-1}7/10 \approx 34.99°$; 35° is also correct)

Question 8

Answer: (a) 4.8 m (√(25 - 1.96) = √(23.04)) (b) 73.7° ($\cos^{-1}(1.4)/(5)$)

Question 9

Answer: Yes. $20^2 + 21^2 = 400 + 441 = 841 = 29^2$

Question 10

Answer: (a) Both have a right angle (object vertical on level ground) and the sun's rays hit at the same angle, so the angles are equal (AA). (b) 12 m ((1.6)/(2) = h/15)