Pythagoras or trigonometry?

Right-angled triangles. Give lengths to 3 significant figures and angles to 1 decimal place.

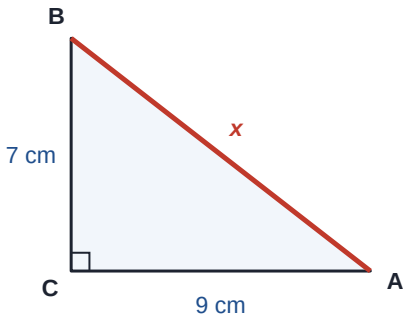
Name _____

Date _____

Part A: one of each

Each question tells you which method to use. Diagrams are not drawn accurately.

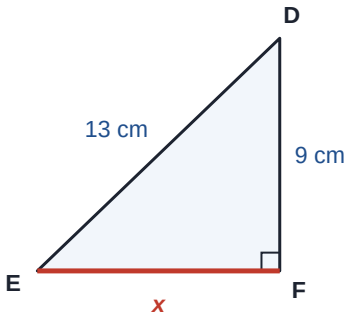
1 PYTHAGORAS: LONGEST SIDE



Find the length x.

Answer: _____

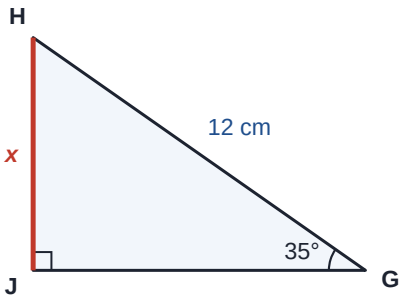
2 PYTHAGORAS: A SHORTER SIDE



Find the length x.

Answer: _____

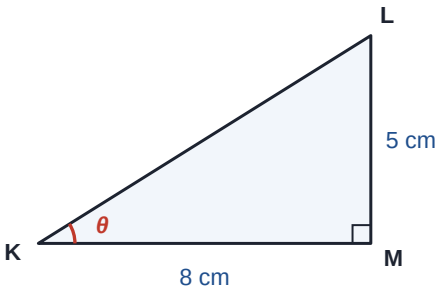
3 TRIGONOMETRY: A SIDE



Find the length x.

Answer: _____

4 TRIGONOMETRY: AN ANGLE



Find the angle θ.

Answer: _____

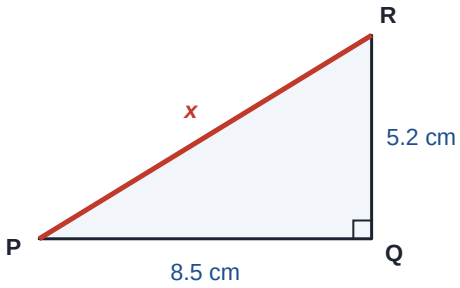
Part B: you decide

Pythagoras $a^2 + b^2 = c^2$
Use it when you know two sides and want the third side. No angle is given or asked for.

Trigonometry SOH CAH TOA
Use it when an angle (other than the right angle) is given, or when you are asked to find one.

For each question, tick the method you need, then work out the answer. Each answer matches a letter in the code table. The letters from questions 1 to 8, in order, spell a word.

1

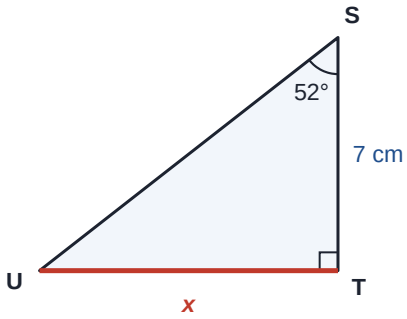


Find x.

Which method? ☐ Pythagoras ☐ Trigonometry

Answer: _____ Letter: ___

2

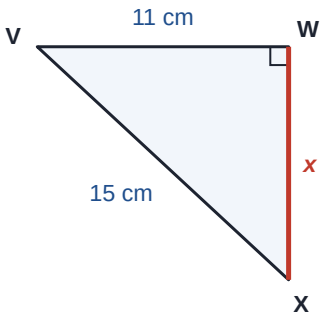


Find x.

Which method? ☐ Pythagoras ☐ Trigonometry

Answer: _____ Letter: ___

3

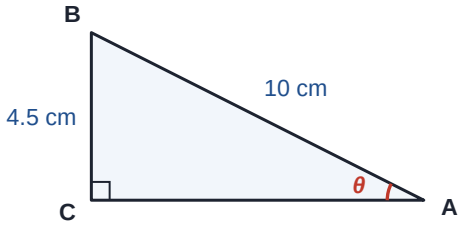


Find x.

Which method? ☐ Pythagoras ☐ Trigonometry

Answer: _____ Letter: ___

4

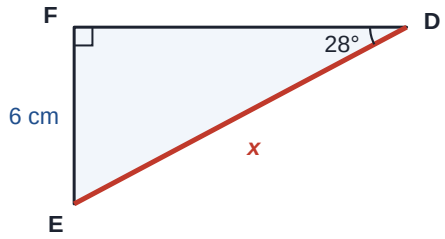


Find θ.

Which method? ☐ Pythagoras ☐ Trigonometry

Answer: _____ Letter: ___

5

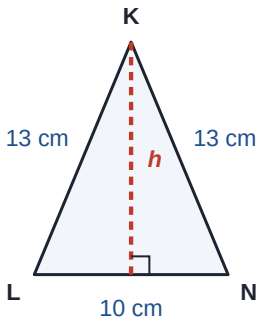


Find x.

Which method? ☐ Pythagoras ☐ Trigonometry

Answer: _____ Letter: ___

6

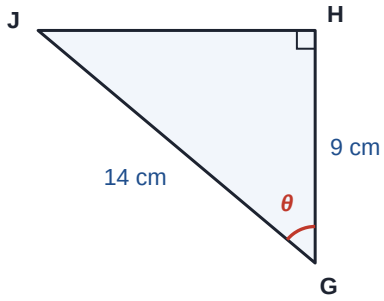


The triangle is isosceles. Find its height h.

Which method? ☐ Pythagoras ☐ Trigonometry

Answer: _____ Letter: ___

7

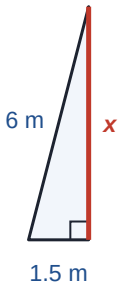


Find θ.

Which method? ☐ Pythagoras ☐ Trigonometry

Answer: _____ Letter: ___

8



A ladder 6 m long leans against a vertical wall. Its foot is 1.5 m from the wall. How high up the wall does it reach?

Which method? ☐ Pythagoras ☐ Trigonometry

Answer: _____ Letter: ___

2.82	5.52	5.81	6.18	6.72	8.31	8.96	9.96	10.2	12.0	12.8	18.6	24.2	26.7	40.0	50.0
Q	**K**	**E**	**P**	**X**	**B**	**I**	**D**	**S**	**N**	**A**	**W**	**V**	**T**	**L**	**C**

1	2	3	4	5	6	7	8

Answers

Part A

1. $x^2 = 7^2 + 9^2 = 130 \Rightarrow x = \sqrt{130} = 11.4$ cm

2. $x^2 = 13^2 - 9^2 = 88 \Rightarrow x = \sqrt{88} = 9.38$ cm

3. $\sin 35^\circ = \dfrac{x}{12} \Rightarrow x = 12 \sin 35^\circ = 6.88$ cm

4. $\tan \theta = \dfrac{5}{8} \Rightarrow \theta = \tan^{-1}\left(\dfrac{5}{8}\right) = 32.0^\circ$

Part B

1. Pythagoras. $x^2 = 5.2^2 + 8.5^2 \Rightarrow x = 9.96$ cm → **D**

2. Trigonometry. $\tan 52^\circ = \dfrac{x}{7} \Rightarrow x = 7 \tan 52^\circ = 8.96$ cm → **I**

3. Pythagoras. $x^2 = 15^2 - 11^2 = 104 \Rightarrow x = 10.2$ cm → **S**

4. Trigonometry. $\sin \theta = \dfrac{4.5}{10} \Rightarrow \theta = 26.7^\circ$ → **T**

5. Trigonometry. $\sin 28^\circ = \dfrac{6}{x} \Rightarrow x = \dfrac{6}{\sin 28^\circ} = 12.8$ cm → **A**

6. Pythagoras. The height cuts the base in half, so use 5 cm, not 10 cm.
$h^2 = 13^2 - 5^2 = 144 \Rightarrow h = 12.0$ cm → **N**

7. Trigonometry. $\cos \theta = \dfrac{9}{14} \Rightarrow \theta = 50.0^\circ$ → **C**

8. Pythagoras. $x^2 = 6^2 - 1.5^2 = 33.75 \Rightarrow x = 5.81$ m → **E**

The word is **DISTANCE**. Some of the other letters come from common slips: adding the squares when you know the longest side (questions 3 and 8), using the whole base in question 6, or picking the wrong ratio in questions 2, 4 and 7.