6 Shorter sides and trig – Part 2

Name: _____ Class: _____ Date: _____

Vocabulary 词汇

Write each word three times. 把每个单词抄写三遍。

English	中文	Write it 3 times (English)		
opposite	对边			
adjacent	邻边			

Recall

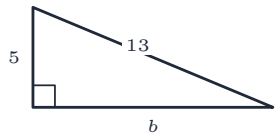
Pythagoras can also find a shorter side, and trigonometry links the sides to an angle.

New ideas

Read these first, then do the Practice.

■ 1 Finding a shorter side

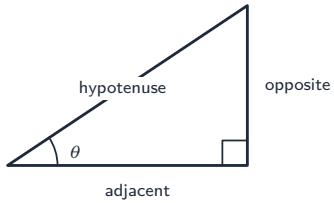
To find a shorter side, **subtract**: square the hypotenuse, take away the other side, then take the square root:



$$b^2 = 13^2 - 5^2 = 144$$
$$b = \sqrt{144} = 12$$

■ 2 Trigonometry

For an angle θ, label the sides **opposite** 对边, **adjacent** 邻边 and hypotenuse. Then use **SOH CAH TOA**:



SOH CAH TOA

$$\sin\theta = \frac{\text{opp}}{\text{hyp}}, \quad \cos\theta = \frac{\text{adj}}{\text{hyp}}, \quad \tan\theta = \frac{\text{opp}}{\text{adj}}$$

Watch out: to find a **shorter** side, *subtract*: $b^2 = c^2 - a^2$ (square the hypotenuse, take away the known side). For trig, label opposite / adjacent / hypotenuse for the angle first, then pick SOH, CAH or TOA.

Practice

Try these in order.

6.6 A right-angled triangle has hypotenuse 10 cm and one shorter side 6 cm. Find the other side. [2]

6.7 To find a shorter side with Pythagoras, do you add or subtract? [1]

6.8 What does the "S" in SOH stand for? [1]

6.9 Write the formula for $\tan\theta$. [1]

6.10 Which side is the *hypotenuse* in a right-angled triangle? [1]

6.11 Challenge. A right-angled triangle has hypotenuse 26 cm and one shorter side 10 cm. Find the other shorter side. [3]