

Starter

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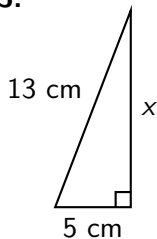
▶ Starter 1

Starter 1

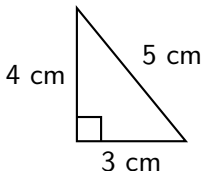
1.

Which pairs of cardinal directions (North, South, East, West) meet at right angles?

3.

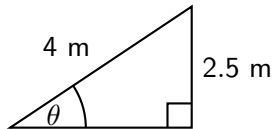


2.



Which side is the hypotenuse?

4.



Find θ .

(A) $\theta = \sin^{-1}\left(\frac{2.5}{4}\right)$

(B) $\theta = \cos^{-1}\left(\frac{2.5}{4}\right)$

(C) $\theta = \tan^{-1}\left(\frac{2.5}{4}\right)$

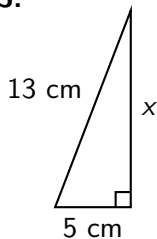
Starter 1

1.

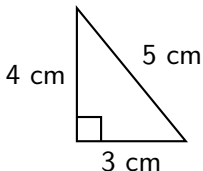
Which pairs of cardinal directions (North, South, East, West) meet at right angles?

North and East, North and West,
South and East, South and West.

3.



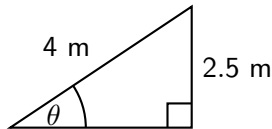
2.



Which side is the hypotenuse?

The side labelled 5 cm is the hypotenuse.

4.



Find θ .

(A) $\theta = \sin^{-1}\left(\frac{2.5}{4}\right)$

(B) $\theta = \cos^{-1}\left(\frac{2.5}{4}\right)$

(C) $\theta = \tan^{-1}\left(\frac{2.5}{4}\right)$

Worked Solution: Starter 1, Question 1

Question: Which pairs of cardinal directions (North, South, East, West) meet at right angles?

Worked Solution:

The cardinal directions are spaced 90° apart around a compass. Two directions meet at a right angle exactly when they are adjacent on the compass, rather than opposite. The adjacent pairs are:

North and East, North and West, South and East, South and West.

Thus those four pairs meet at right angles. North and South, and East and West, are straight lines, not right angles.

Worked Solution: Starter 1, Question 2

Question: In the right-angled triangle with sides 3 cm, 4 cm and 5 cm, which side is the hypotenuse?

Worked Solution:

The hypotenuse is the longest side of a right-angled triangle and is opposite the right angle. Since $5 > 4 > 3$, the side of length 5 cm is the longest; it is opposite the right angle.

Indeed, by Pythagoras:

$$3^2 + 4^2 = 9 + 16 = 25 = 5^2.$$

So the hypotenuse is the side labelled 5 cm.

Worked Solution: Starter 1, Question 3

Question: A right-angled triangle has hypotenuse 13 cm and one leg 5 cm. Find the missing side x .

Worked Solution:

By Pythagoras' theorem,

$$(\text{hypotenuse})^2 = (\text{leg})^2 + (\text{other leg})^2.$$

Here the hypotenuse is 13 cm and one leg is 5 cm, so

$$13^2 = 5^2 + x^2.$$

Therefore

$$169 = 25 + x^2$$

$$x^2 = 169 - 25 = 144.$$

Taking the positive square root, since x is a length:

$$x = \sqrt{144} = 12.$$

$x = 12 \text{ cm}$

Worked Solution: Starter 1, Question 4

Question: Find θ in the right-angled triangle where the side opposite θ is 2.5 m and the hypotenuse is 4 m. The options are:

$$(A) \theta = \sin^{-1}\left(\frac{2.5}{4}\right), \quad (B) \theta = \cos^{-1}\left(\frac{2.5}{4}\right), \quad (C) \theta = \tan^{-1}\left(\frac{2.5}{4}\right).$$

Worked Solution:

In a right-angled triangle,

$$\sin \theta = \frac{\text{opposite}}{\text{hypotenuse}}.$$

The side opposite θ is 2.5 m and the hypotenuse is 4 m, so

$$\sin \theta = \frac{2.5}{4}.$$

Taking the inverse sine of both sides gives

$$\theta = \sin^{-1}\left(\frac{2.5}{4}\right).$$

Therefore the correct option is **(A)**.