GCSE Maths: Trigonometry: finding sides (SOH CAH TOA) (Foundation): worksheet

GCSE Maths - Pythagoras and Trigonometry - Foundation - Lesson 20.4

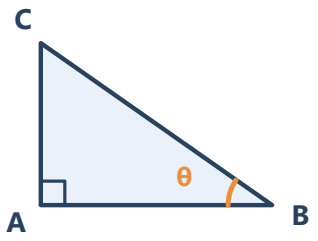
Name: _____ Date: _____ Score: _____

24 questions. Write your answers in the spaces. Answers and step-by-step help are free at **websink.site/gcse/maths/ch20-pythagoras-trigonometry/foundation/trigonometry-finding-sides-soh-cah-toa/**

Exercise 20E Labelling sides and choosing the ratio Non-calculator

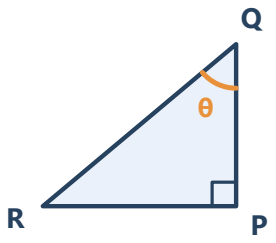
1 The angle θ is marked in each right-angled triangle. Name the hypotenuse, the opposite side and the adjacent side.

(a)



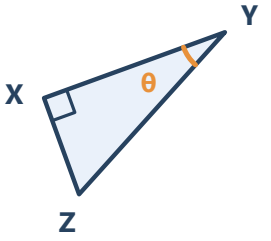
Answer: .....

(b)



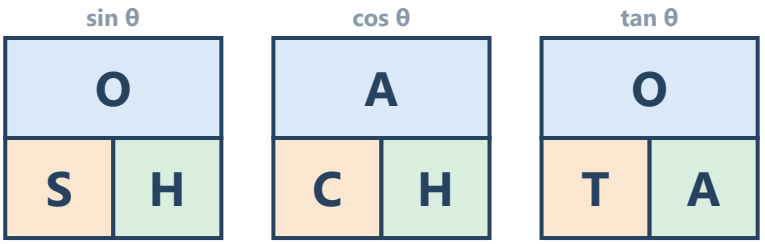
Answer: .....

(c)



Answer: .....

2 Write down what each of S, O, H, C, A, T stands for, and then complete each ratio.



(a) sin θ =

Answer:

(b) cos θ =

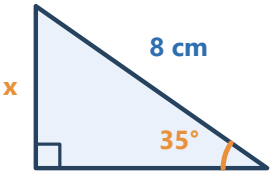
Answer:

(c) tan θ =

Answer:

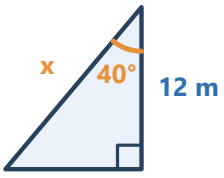
3 Which ratio, sin, cos or tan, would you use to find *x*? Write down the ratio only.

(a)



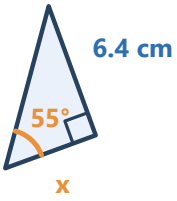
Answer:

(b)



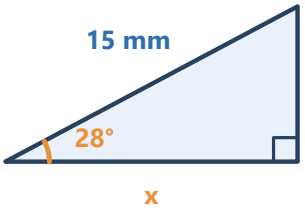
Answer:

(c)



Answer:

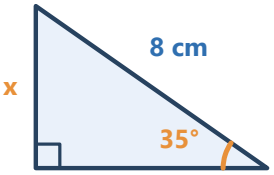
(d)



Answer:

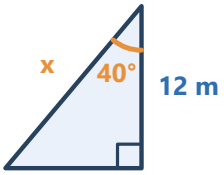
4 Write down an equation that you could use to find *x*. Do **not** solve it.

(a)



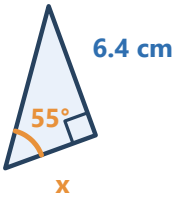
Answer:

(b)



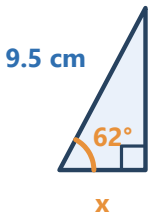
Answer:

(c)



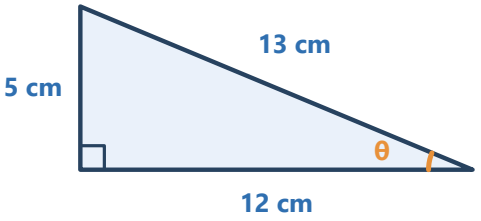
Answer:

(d)



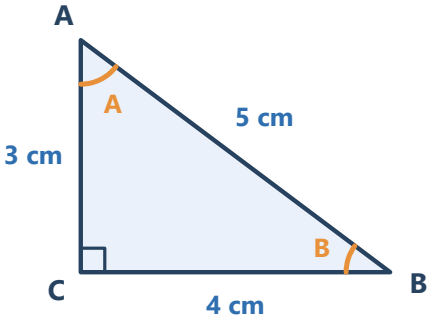
Answer:

5 For the triangle shown, write down sin θ, cos θ and tan θ as fractions.



Answer:

6 The triangle ABC has a right angle at C. For angle A, write down the opposite and adjacent sides. Then do the same for angle B. What do you notice?

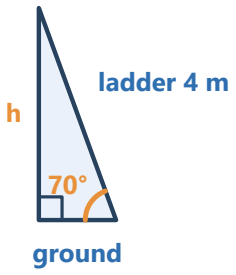


Answer:

7 For each situation, choose the ratio you would use. Label the sides of the sketch first.

(a)

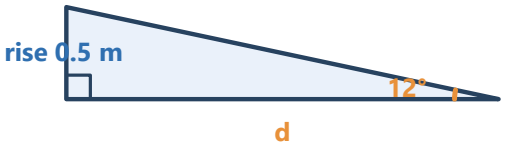
A 4 m ladder makes an angle of 70° with the ground. You want its height *h* up the wall. Which ratio (sin, cos or tan)?



Answer:

(b)

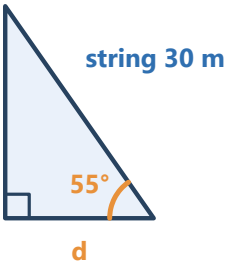
A ramp rises 0.5 m and makes an angle of 12° with the ground. You want the horizontal distance *d*. Which ratio?



Answer:

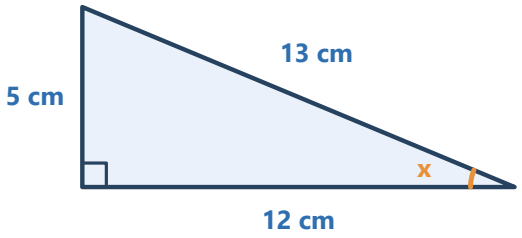
(c)

A kite string is 30 m long and makes an angle of 55° with the level ground. You want the horizontal distance *d* from the kite to the person. Which ratio?



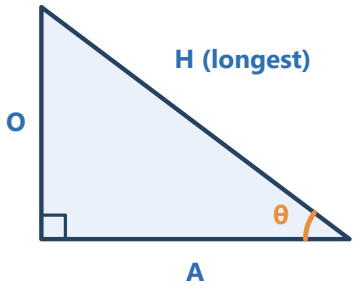
Answer:

8 **Dev says that tan $x = \frac{5}{13}$ for this triangle. Explain his mistake and write down the correct value of tan x as a fraction.**



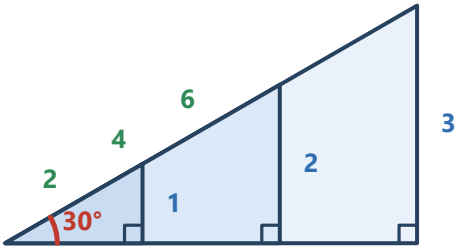
Answer:

9 Explain why sin θ and cos θ can never be bigger than 1 for an angle θ in a right-angled triangle.



Answer:

10 The diagram shows three right-angled triangles that share a 30° angle. Work out (opposite) ÷ (hypotenuse) for each triangle and say what you notice.



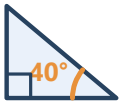
Answer:

Exercise 20F Finding sides with sin, cos and tan

Calculator allowed

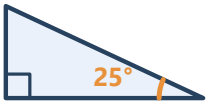
1 Use a calculator in degree mode to work out each value. Give each answer correct to 3 decimal places.

(a) sin 40°



Answer:

(b) cos 25°



Answer:

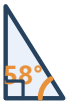
(c) tan 63°

Answer:

(d) sin 72°

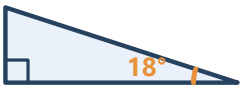
Answer:

(e) cos 58°



Answer:

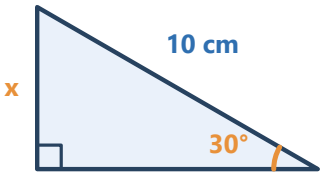
(f) tan 18°



Answer:

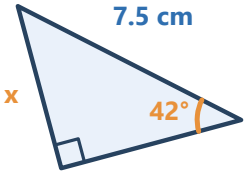
2 Work out the length of the side marked *x* in each triangle. Give your answers correct to 1 decimal place. All the lengths are in centimetres.

(a)



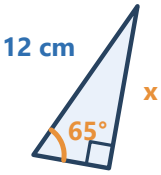
Answer:

(b)



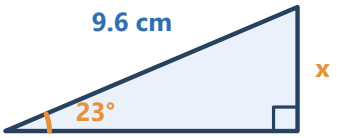
Answer:

(c)



Answer:

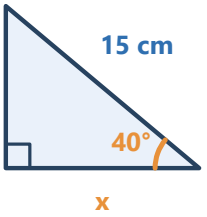
(d)



Answer:

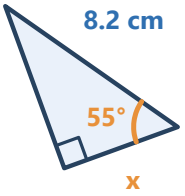
3 Work out the length of the side marked *x* in each triangle. Give your answers correct to 1 decimal place. All the lengths are in centimetres.

(a)



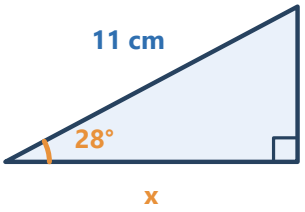
Answer:

(b)



Answer:

(c)



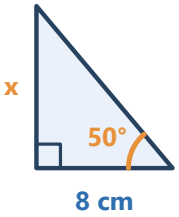
Answer:

(d)

Answer:

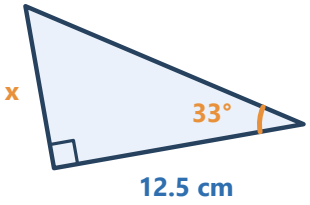
4 Work out the length of the side marked *x* in each triangle. Give your answers correct to 1 decimal place. All the lengths are in centimetres.

(a)



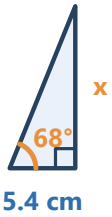
Answer:

(b)



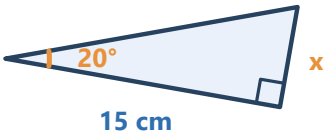
Answer:

(c)



Answer:

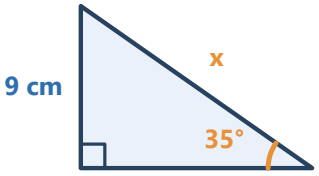
(d)



Answer:

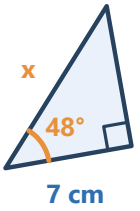
5 Work out the length of the side marked *x* in each triangle. Be careful: in some of them *x* will be on the bottom of the fraction. Give your answers correct to 1 decimal place. All the lengths are in centimetres.

(a)



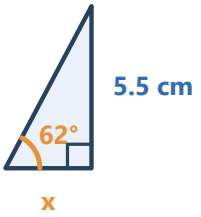
Answer:

(b)



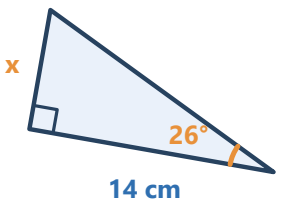
Answer:

(c)



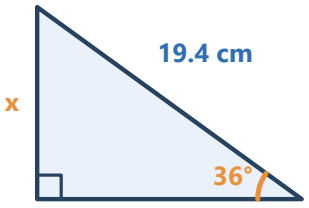
Answer:

(d)



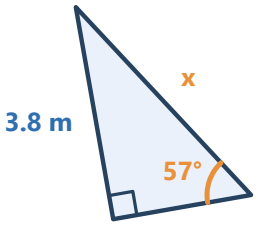
Answer:

6 Work out the length *x*. Give your answer correct to 3 significant figures.



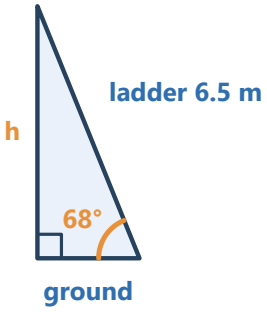
Answer:

7 Work out the length *x*. Give your answer correct to 2 decimal places.



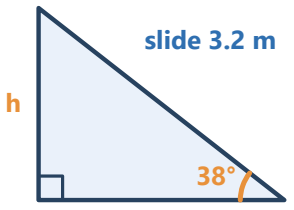
Answer:

8 A ladder 6.5 m long leans against a vertical wall. The ladder makes an angle of 68° with the horizontal ground. How high up the wall does the ladder reach? Give your answer correct to 2 decimal places.



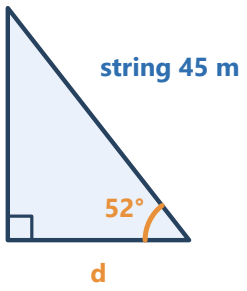
Answer:

9 A slide is 3.2 m long and slopes at 38° to the horizontal. Work out the vertical height of the top of the slide above the ground. Give your answer correct to 2 decimal places.



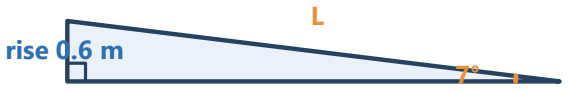
Answer:

10 A kite is flying on a string 45 m long. The string makes an angle of 52° with the level ground. Work out the horizontal distance from the person to the point on the ground below the kite. Give your answer correct to 1 decimal place.



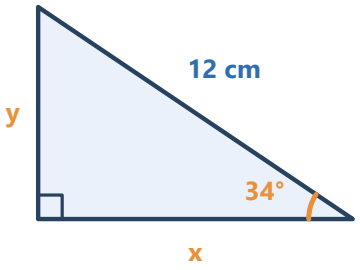
Answer:

11 A wheelchair ramp rises 0.6 m and makes an angle of 7° with the ground. How long is the ramp? Give your answer correct to 2 decimal places.



Answer:

12 In this right-angled triangle the hypotenuse is 12 cm and one angle is 34°. Find *x* and *y*, correct to 1 decimal place.



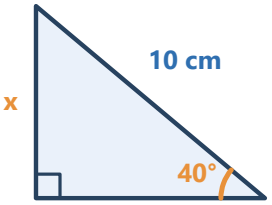
(a) *y* (opposite the 34° angle)

Answer:

(b) *x* (next to the 34° angle)

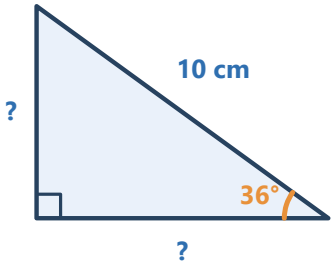
Answer:

13 Anya works out *x* in this triangle as 10 × cos 40° = 7.7 cm. Explain her mistake and find the correct value of *x*, to 1 decimal place.



Answer:

14 **Challenge.** A right-angled triangle has a hypotenuse of 10 cm and an angle of 36°. Work out the perimeter of the triangle, correct to 1 decimal place.



Answer:

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