



Trigonometric ratios

About 45 minutes Calculator allowed 40 marks

Date _____

A Do Now

The first question is what today's lesson needs. The others bring back earlier topics.

- A1** Needed today [2 marks]

An isosceles triangle has two sides of 39 cm and a base of 30 cm. Find its area.

A2 Last lesson [2 marks]

A cuboid is 12 cm by 14 cm by 12 cm. Find the length of its longest diagonal.

Answer

Answer

- A3** From chapter 1 [2 marks]

$A = 2 \times 3^2$ and $B = 2^2 \times 3^2$. Find the lowest common multiple of A and B . Give your answer as an ordinary number.

A4 From chapter 7 [2 marks]

Enlarge the point $(1, -6)$ by scale factor -1 , centre $(3, -2)$.

Answer

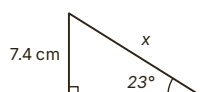
Answer

B Examples, then your turn

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

Work out the length x . Give your answer to 1 decimal place.



Not drawn accurately

Hint The unknown is underneath the fraction line, so divide by the ratio.

B1 Work out the length x . Give your answer to 1 decimal place. [3 marks]

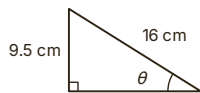


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Answer

EXAMPLE 2

Work out the size of angle θ . Give your answer to 1 decimal place.

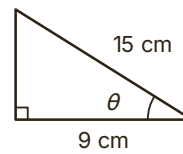


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Hint You know the opposite and the hypotenuse, so use $\sin^{-1}$.

B2 Work out the size of angle θ . [2 marks]

Give your answer to 1 decimal place.

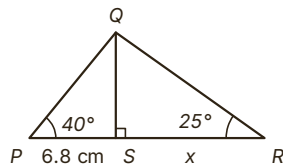


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Answer

c Practice

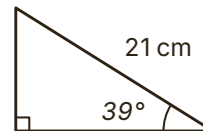
C1 PSR is a straight line. Work out the length x , to 1 d.p. [3 marks]



Not drawn accurately

Answer

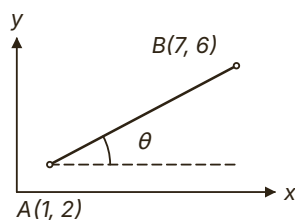
C2 Work out the area of the triangle, to 3 significant figures. [3 marks]



Not drawn accurately

Answer

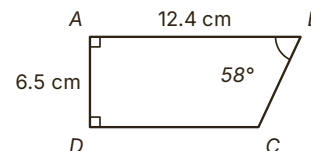
C3 The line AB joins $A(1, 2)$ and $B(7, 6)$. Work out the angle θ between AB and the horizontal, to 1 d.p. [3 marks]



Not drawn accurately

Answer

C4 $ABCD$ is a trapezium. AB is parallel to DC and angle $DAB = 90^\circ$. $AB = 12.4$ cm, $AD = 6.5$ cm and angle $ABC = 58^\circ$. Work out the perimeter of $ABCD$. Give your answer to 3 significant figures. [5 marks]



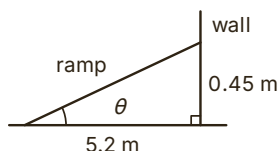
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Answer

D Exam-style questions

- D1** Sam says, " $\tan 40^\circ$ is twice $\tan 20^\circ$, because 40° is twice 20° ." [2 marks]
Show that Sam is wrong.

- D2** A ramp to a doorway 0.45 m up must make **at most** 4.8° with the level ground.



Not drawn accurately

- (a) Jo works out $\theta = \sin^{-1}(0.45 \div 5.2)$. Explain Jo's mistake. [1 mark]
- (b) Is the ramp in the diagram allowed? You must show your working. [3 marks]

Answer

- (c) Work out the shortest ramp, along the slope, that is allowed, to 3 s.f. [3 marks]

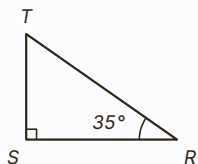
Answer

Total for D2: 7 marks

E Extension

No route is given. The hints are at the end of the sheet. Use one at a time.

- E1** In triangle RST , angle $S = 90^\circ$ and angle $R = 35^\circ$. The side RS is 5 cm longer than the side ST . Work out the length of ST , to 1 decimal place. [4 marks]



Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Call ST x cm. What is RS in terms of x ?
- Hint 2** $\tan 35^\circ = \frac{x}{x+5}$.
- Hint 3** $x = (x+5) \tan 35^\circ$, so $x(1 - \tan 35^\circ) = 5 \tan 35^\circ$.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can name the opposite, adjacent and hypotenuse and choose the right ratio. ☐ ☐ ☐

I can find a side whether it is above or below the fraction line. ☐ ☐ ☐

I can find an angle from two sides. ☐ ☐ ☐