

# FluidMaths

GCSE Mathematics (Grade 9-1)

Problem Solving

Trig Set 3

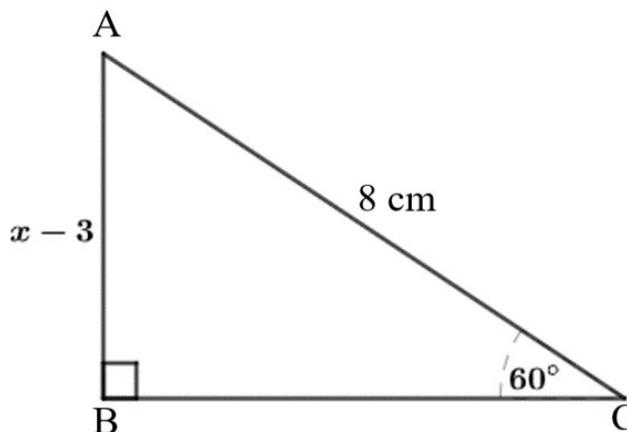
SOHCAHTOA-Exact Values

Questions

## Some useful strategies in problem-solving

- Read the question carefully
- Sketch a diagram where applicable
- Take note of key information
- Write down any formulae you may need
- Tackle the problem in bite-size rather than as a whole
- Concentrate on the part of the problem you understand and start from there
- Collaborate with a partner and share ideas
- Use a dictionary to find the meaning of any confusing words
- Check that your answers make sense in the context of the question

1 ABC is a right-angled triangle.



$$AC = 8 \text{ cm}$$

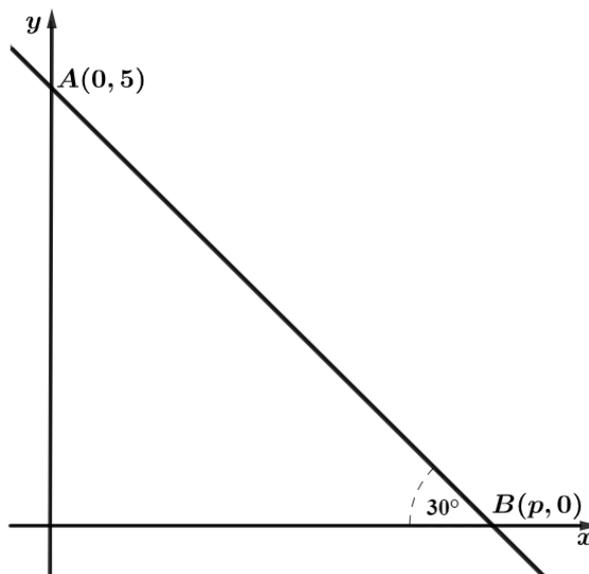
$$AB = x - 3$$

$$\text{Angle } ACB = 60^\circ$$

Calculate the exact value of  $x$ .

[4marks]

2 The graph of a straight line is shown below



The Line makes an angle of  $30^\circ$  with the  $x$ -axis

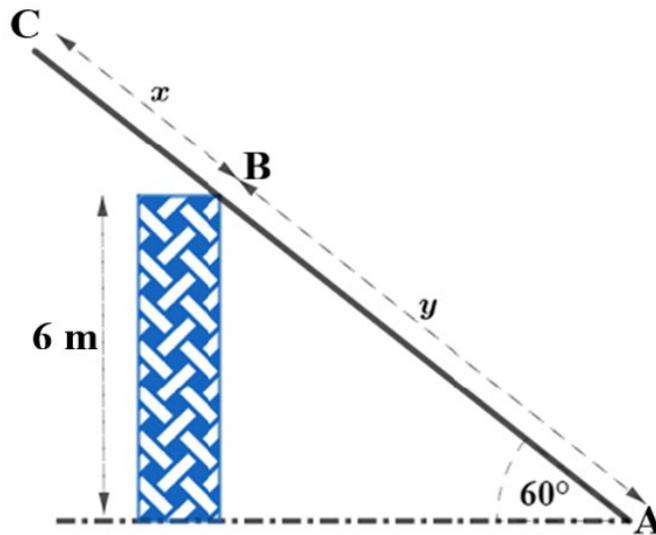
Point A has coordinates  $(0, 5)$

Point B has coordinates  $(p, 0)$

Show that  $p = 5\sqrt{3}$ .

[5marks]

- 3 The diagram shows a stick AC leaned against a vertical wall. The stick is inclined at an angle of  $60^\circ$  to the ground.



B is the point where the stick touches the 6 m wall

$$AB = y$$

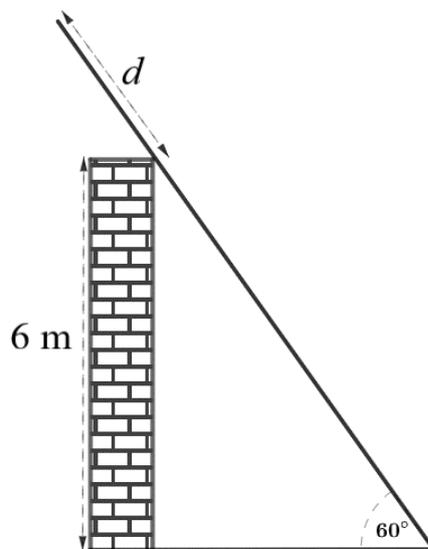
$$BC = x$$

Given that the stick is  $\sqrt{75}$  m long,

Calculate the exact values of  $x$  and  $y$

[4marks]

- 4 A 10 m stick is leaned against a 6 m wall such that, part of the stick goes over the wall as shown below.

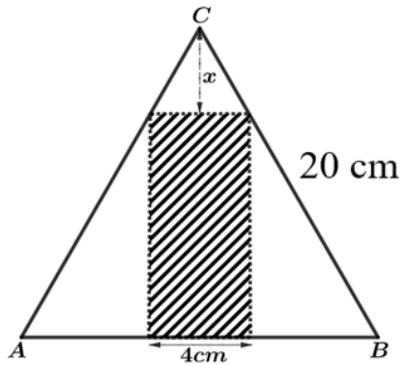


The stick is inclined at an angle of  $60^\circ$  to the ground

Prove that  $d = 10 - 4\sqrt{3}$

[4marks]

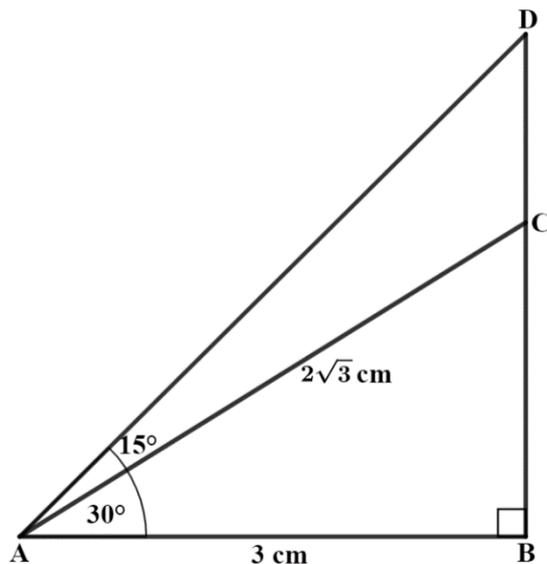
- 5 ABC is an equilateral triangle of side 20 cm.  
A rectangular pattern is drawn inside the triangle as shown



The rectangular pattern is 4 cm wide  
Calculate the exact value of  $x$  [5marks]

- 6 Given that  $\sin x = \frac{2}{3}$   
Calculate the exact value of  $3 \cos x + 5 \tan x$  [4marks]

- 7 ABD is a right-angled triangle



$$AB = BD = 3\text{cm}$$

$$AC = 2\sqrt{3}\text{ cm}$$

$$\text{Angle BAC} = 30^\circ$$

$$\text{Angle CAD} = 15^\circ$$

Show that  $\sin 15 = \frac{\sqrt{6}-\sqrt{2}}{4}$  [6marks]