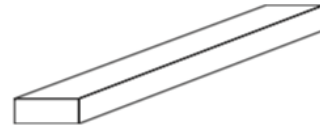


## Problem solving simultaneous equations

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### Question 1



A solid cuboid has a volume of  $40 \text{ cm}^3$ .  
 The cuboid has a total surface area of  $100 \text{ cm}^2$ .  
 One edge of the cuboid has length  $2 \text{ cm}$ .

Find the length of a diagonal of the cuboid.  
 Give your answer correct to 3 significant figures.

..... cm

**(6 marks)**

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### Question 2

Prove algebraically that the straight line with equation  $x - 2y = 10$  is a tangent to the circle with equation  $x^2 + y^2 = 20$

*Input note: write down the coordinates where the tangent touches the circle.*

.....

**(5 marks)**

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### Question 3

A cinema sells adult tickets and child tickets.

The total cost of 3 adult tickets and 1 child ticket is £30.

The total cost of 1 adult ticket and 3 child tickets is £22.

Work out the cost of an adult ticket and the cost of a child ticket.

adult ticket £ .....

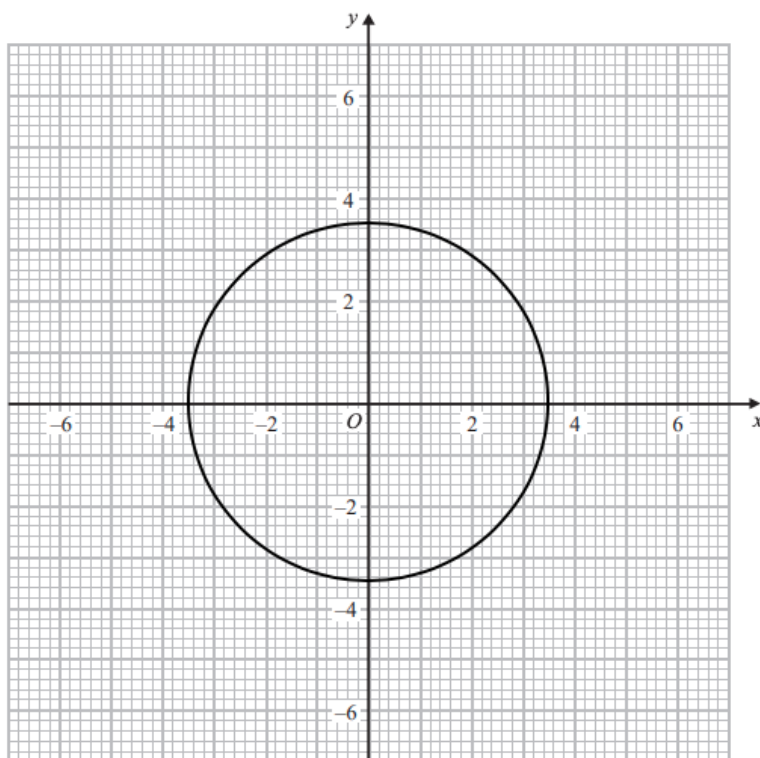
child ticket £ .....

**(4 marks)**

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### Question 4

The graph of  $x^2 + y^2 = 12.25$  is drawn below.



Hence find estimates for the solutions of the simultaneous equations

$$x^2 + y^2 = 12.25$$

$$2x + y = 1$$

**(3 marks)**

### Question 5

Kate buys 2 lollies and 5 choc ices for £6.50

Pete buys 2 lollies and 3 choc ices for £4.30

Work out the cost of one lolly.

Give your answer in pence.

..... p

**(3 marks)**

## Question 6

Here are the first six terms of a Fibonacci sequence.

1 1 2 3 5 8

The rule to continue a Fibonacci sequence is,

the next term in the sequence is the sum of the two previous terms

The first three terms of a different Fibonacci sequence are

$a$   $b$   $a + b$

We can show that the 6th term of the sequence is  $3a + 5b$

Given that the 3rd term is 7 and the 6th term is 29, find the value of  $a$  and the value of  $b$ .

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