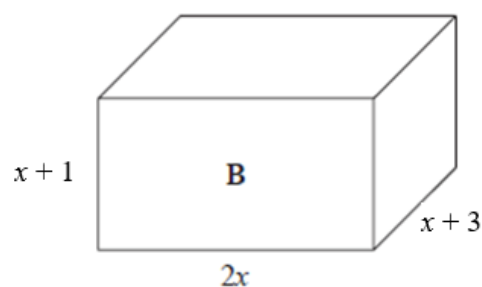
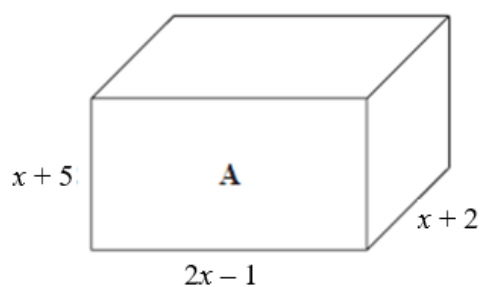


QUESTION 1

Here are two cuboids.



All lengths are measured in centimetres.

The volume of cuboid **A** is 150 cm^3 greater than the volume of cuboid **B**.

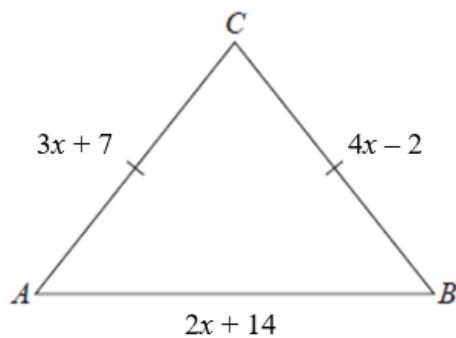
Work out the value of x .

$x = \dots\dots\dots$

(5 marks)

QUESTION 2

The diagram shows triangle ABC .



In the diagram, all measurements are in centimetres.

$$AC = BC$$

The perimeter of the triangle is 100 cm.

Work out the area of the triangle.

..... cm²

(5 marks)

QUESTION 3

Use algebra to solve the simultaneous equations

$$3x - 8y = 13$$

$$5x + 6y = -46$$

You must show all your working.

$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

(4 marks)

QUESTION 4

Solve the simultaneous equations

$$y^2 = 2x^2 + 5$$

$$y - 3x = 11$$

Give your solutions correct to 3 significant figures.

.....

(4 marks)

QUESTION 5

Solve the simultaneous equations

$$2x - 6y = 22$$

$$3x - 4y = 23$$

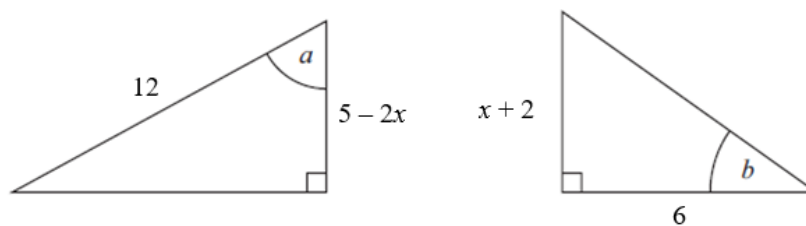
$$x = \dots\dots\dots$$

$$y = \dots\dots\dots$$

(4 marks)

QUESTION 6

The diagram shows two right-angled triangles.



All lengths are measured in centimetres.

Given that

$$\cos a = \tan b$$

work out the value of x .

[3]

Question 7

A ball is thrown upwards and reaches a maximum height.
The ball then falls and bounces repeatedly.

After the n th bounce, the ball reaches a height of h_n
After the next bounce, the ball reaches a height given by $h_{n+1} = 0.45h_n$

After the 1st bounce, the ball reaches a height of 6 metres.

What height does the ball reach after the 4th bounce?
Give your answer to 3 decimal places.

..... metres

(3 marks)

Question 8

Martina has three lorry loads of paving slabs.

There are x paving slabs on lorry **A**.

There are $(2x - 1)$ paving slabs on lorry **B**.

There are $(3x + 5)$ paving slabs on lorry **C**.

There is a total of 58 paving slabs on the three lorries.

All the paving slabs have the same mass.

The paving slabs on lorry **B** have a total mass of 680 kg.

Work out the total mass of the paving slabs on lorry **A**.

[4]

Question 9Solve $6x + 23 = 43 - 2x$ $x = \dots\dots\dots$ **(3 marks)****Question 10**(a) Show that the equation $x^3 + 2x - 15 = 0$ has a solution between $x = 2$ and $x = 3$ **(2)**(b) Show that the equation $x^3 + 2x - 15 = 0$ can be rearranged to give $x = \frac{15}{x^2 + 2}$

|

(1)(c) Starting with $x_0 = 2.2$, use the iteration formula $x_{n+1} = \frac{15}{x_n^2 + 2}$ twiceto find an estimate for the solution of $x^3 + 2x - 15 = 0$

Give your answer correct to 4 decimal places.

(3)

Question 11

Solve $5x^2 + 7x - 4 = 0$

Give your solutions correct to 3 significant figures.

.....
(3)**Question 12**

8 kg of aubergines and 3 kg of radishes cost a total of £28

cost of 1 kg of aubergines : cost of 1 kg of radishes = 1 : 2

Work out the cost of 1 kg of aubergines and the cost of 1 kg of radishes.

aubergines £.....

radishes £..... **(4)**

Question 13

(a) Show that the equation $x^4 - 2x^2 - 2 = 0$ can be written in the form $x = \sqrt[4]{2x^2 + 2}$

(1)

(b) Starting with $x_0 = 1.5$

use the iteration formula $x_{n+1} = \sqrt[4]{2x_n^2 + 2}$ three times to find an estimate for a solution of $x^4 - 2x^2 - 2 = 0$

.....
(3)

Question 14

Solve $\frac{1}{x+5} + \frac{4}{2-2x} = 1$

(4)

Question 15**Do not use a calculator for this question**

Solve $\frac{1}{x} - \frac{3}{3x+2} = 3$

Give your answer in the form $a \pm b\sqrt{3}$ where a and b are fractions.

.....(5)

Question 16

Solve $6x^2 - x - 12 = 0$

.....
(3 marks)

Question 17

Solve $\frac{1}{x-1} + \frac{3}{2x-1} = 1$

Give your answer in the form $\frac{p \pm \sqrt{q}}{2}$ where p and q are integers......
(4 marks)

Question 18

L is the straight line with equation $y = 2x + 2$

C is a graph with equation $y^2 = 2x^2 + 7x + 32$

Using algebra, find the coordinates of the points of intersection of **L** and **C**.

You must show all your working.

(..... ,)

(..... ,)

(5 marks)

Question 19

The curve **C** has equation $y = x^2 - 3x + 13$

The line **L** has equation $y - 3x - 4 = 0$

Show, algebraically, that **C** and **L** have exactly one point in common.

(4)