Q1.

Three people were born on the same date, but in different years.

The second person was born 5 years after the first.
The third person was born 7 years after the **first**.

Use algebra to prove that the sum of their ages will always be a multiple of 3

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(Total 3 marks)

Q2. Pens cost 15 pence each.
Rulers cost 20 pence each.

(a)   Write down an expression for the cost of x pens and y rulers.

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Answer ....

(2)

(b)   A school buys 150 pens and 90 rulers.

The total cost is reduced by $\dfrac{1}{5}$

How much does the school pay?

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Answer £ ....

(5)
(Total 7 marks)

Q3.(a)   Expand and simplify $2(a + 3) + 5(a - 1)$

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Answer ....

(2)

(b)   Simplify $5c^4d^2 \times c^2d^3$

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Answer ....

(2)

(c)   Simplify fully $\dfrac{8(x-3)^2}{4(x-3)(x+3)}$

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Answer ....

(2)
(Total 6 marks)

Q4. Simplify fully $\dfrac{11}{2x} - \dfrac{3}{x}$

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Answer ....

(Total 3 marks)

Q5.(a)   Simplify fully $4x + 7y + 5x - y$

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Answer ....

(2)

(b)   Multiply out $4(x + 3)$

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Answer ....

(1)

(c)   Factorise $x^2 - 5x$

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Answer ....

(1)
(Total 4 marks)

Q6. Amy raised £n for charity.
Chris raised £18 more than Amy.

The **mean** amount raised by the two of them is £45.

Work out how much money each one of them raised.

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Amy £ ....

Chris £ ....

(Total 5 marks)

Q7.

Ravi, Sue and Tom do some jobs.

They are each paid £ 4 an hour.

They are paid £ 216 in total.

(a)   Show that they work for 54 hours in total.

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(1)

(b)   Ravi works for x hours.

Sue works 5 hours less than Ravi.

Tom works 8 hours more than Ravi.

Work out how much Ravi is **paid**.

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£ ....

(5)
(Total 6 marks)

Q8.(a)   Circle the expression that is equivalent to $4 \times x$

x^4 $4x$ 4^x $x \times x \times x \times x$

(1)

(b)   Circle the expression that is equivalent to $y \times y \times y$

$3y$ y^2 $3y^2$ y^3

(1)

(c)   Circle the expression that is equivalent to $a + b$

$b + a$ ab ba $2ab$

(1)
(Total 3 marks)

Q9. There are n plums in Bag *A*.
Bag *B* has three times as many plums as Bag *A*.
Bag *C* has 14 more plums than Bag *A*.
Bag *B* and Bag *C* have the same number of plums.

<div align="center">Bag *A*   Bag *B*   Bag *C*</div>

Use algebra to work out the number of plums in Bag *A*.
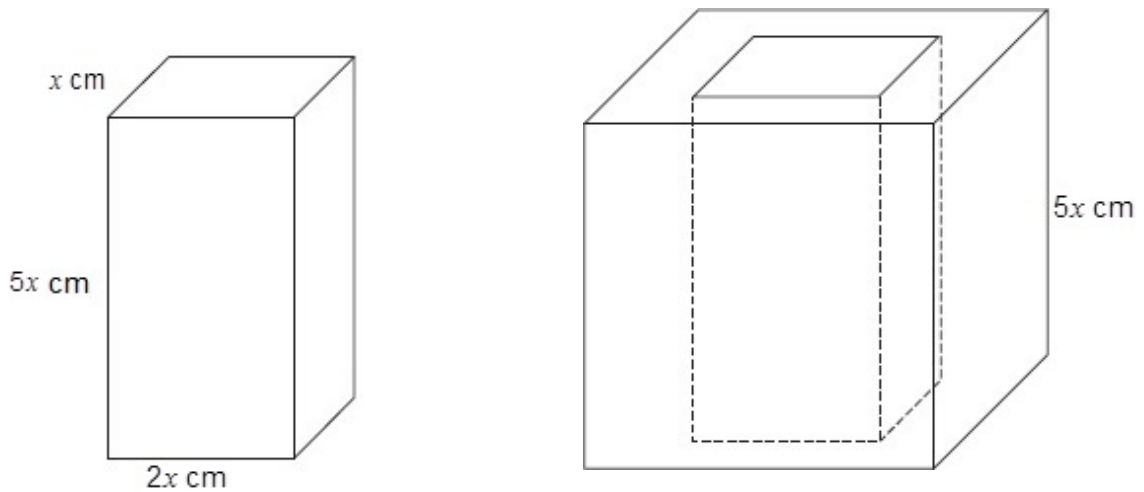You **must** show your working.

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Answer ....

(Total 4 marks)

Q10. The cuboid has been cut out of the wooden cube as shown.

x cm

5*x* cm

2*x* cm

5*x* cm

(a)   Show clearly why the volume of wood remaining, in cubic centimetres, is $115x^3$.

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(3)

(b)   You are given that $x = 3.5$

Work out the volume of wood remaining.

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Answer .... cm³

(2)
(Total 5 marks)

Q11.(a)   Simplify $3a + 2a - a$

Answer ....

(1)

(b)   Simplify $2b \times 3b$

Answer ....

(1)

(c)   Multiply out $3(2c - 1)$

Answer ....

(1)
(Total 3 marks)

Q12. Mr and Mrs Bell have twin daughters and a son.

Mr Bell is four years older than Mrs Bell.

Mrs Bell is three times older than their twin daughters.
The twin daughters are seven years older than the son.

The sum of the five ages is 150.

Let x be the age of the twin daughters.

Set up and solve an equation to work out the age of the twin daughters.
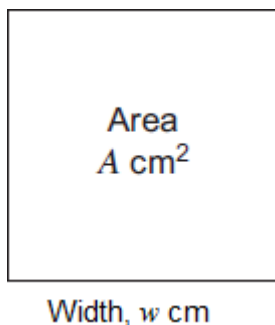
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Answer x = ...

(Total 4 marks)

Q13. The diagram shows a square piece of card.

Area
A cm^2

Width, w cm

(a)   Write down a formula connecting A and w.

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Answer ....

(1)

(b)   This diagram shows a cube.

Volume
V cm^3

Width, w cm
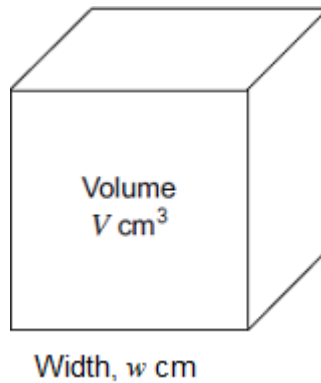
Write down a formula connecting V and w.

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Answer ....

(1)

(c)   The area of one face of a cube is 20 cm^2.

Work out the volume of the cube.

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Answer .... cm^3

(3)
(Total 5 marks)

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