

**Q1.**

Kelly charges for babysitting.  
She uses this formula.

$$\text{charge} = \text{£}6 \text{ per hour} + \text{cost of taxi fare home}$$

- (a) One evening Kelly babysits from 6 pm to 11 pm  
Her taxi fare is £8

Work out the charge.

.....  
 .....  
 .....

£ .....

**(3)**

- (b) The next evening Kelly babysits for 3 hours.  
She charges £23.75

How much is her taxi fare?

.....  
 .....  
 .....

£ .....

**(2)**

**(Total 5 marks)**

- Q2.(a)** Rearrange  $f = 3g + 2$  to make  $g$  the subject.

.....  
 .....

Answer .....

**(2)**

(b) Multiply out  $x^2(4 - x)$

.....  
 .....

Answer .....

(2)  
 (Total 4 marks)

**Q3.** These steps can be used to work out the area of a circle.

Step 1 Square the radius

Step 2 Multiply by 3.14

(a) Use these steps to work out the area of a circle, radius 5 cm.

.....  
 .....

Answer ..... cm<sup>2</sup>

(2)

(b) The area of a circle is known.

Write down the steps to work out the radius.

Step 1 .....

Step 2 .....

(2)  
 (Total 4 marks)

**Q4.**

$$P = 2l + 2w$$

(a) Work out the value of  $P$  when  $l = 5$  and  $w = 8$

.....

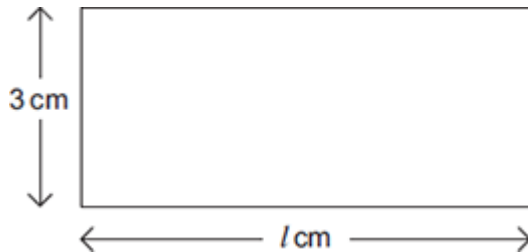
.....

$P =$  .....

(2)

(b) The perimeter of this rectangle is 20 cm.

Not drawn accurately



Work out the value of  $l$ .

.....  
 .....

$l =$  .....

(2)  
 (Total 4 marks)

**Q5.** Rearrange  $2(a + c) = 5(a - b)$  to make  $c$  the subject.

.....  
 .....

Answer .....


(Total 3 marks)

Q6.

**BOB's Autos**

For a repair we charge

Hours worked  $\times$  £18  
+  
Cost of parts



(a) Work out the charge for a repair when

Hours worked = 3

Cost of parts = £ 110

.....

.....

Answer £ .....

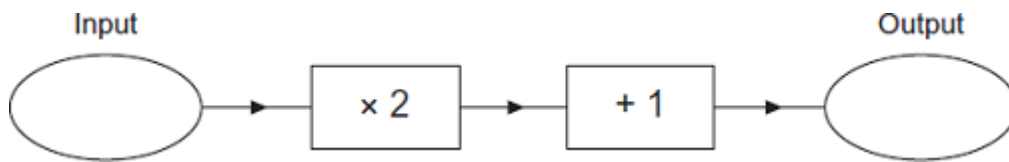
(2)

(b) Complete this table for another repair.

Cost of repair	Hours worked	Cost of parts
£ 240		£ 150

(3)  
(Total 5 marks)

Q7. Here is a number machine.



(a) Work out the **output** when the input is 12.

Answer .....

(1)

(b) Write down an expression for the **output** when the input is  $n$ .

Answer .....

(1)

(c) Work out the **input** when the output is 49.

Answer .....

(2)

(Total 4 marks)

**Q8.** This formula is used for working out the cost, £ $C$ , of repairing a car.

$$C = nL + 1.2P$$

$n$  is the number of hours worked

$L$  is the labour rate (£)

$P$  is the cost of parts (£)

(a) Work out the cost of repairing a car when

$$n = 3$$

$$L = 18$$

$$P = 110$$

.....

.....

.....

Answer £ .....

(2)

(b) Complete this table for another repair.

$C$	$n$	$L$	$P$
£ 235		£ 22	£ 150

(3)

(Total 5 marks)

**Q9.(a)** Work out the value of  $x^3 - 2x + 7$  when  $x = -2.5$

Answer .....

(1)

(b) Factorise fully  $4x^2 + 6xy$

.....  
 .....

Answer .....

(2)  
 (Total 3 marks)

**Q10.**  $E = mv^2$

Work out the value of  $E$  when  $m = 3$  and  $v = 10$

.....  
 .....

Answer .....

(Total 2 marks)

**Q11.(a)**  $E = mv^2$

Work out the value of  $E$  when  $m = 3$  and  $v = 10$

.....  
 .....

Answer .....

(2)

- (b) Julie and Phil rearrange  $E = mv^2$  to make  $v$  the subject.  
 Here are their answers.

**Julie**

$$E = mv^2$$

$$\frac{E}{m} = v^2$$

$$\sqrt{\frac{E}{m}} = v$$

**Phil**

$$E = mv^2$$

$$\sqrt{E} = mv$$

$$\sqrt{\frac{E}{m}} = v$$

$$v = \sqrt{\frac{E}{m}}$$

$$v = \sqrt{\frac{E}{m}}$$

Which student has rearranged the formula correctly?  
Tick a box.

Julie

Phil

What mistake has the other student made?

.....

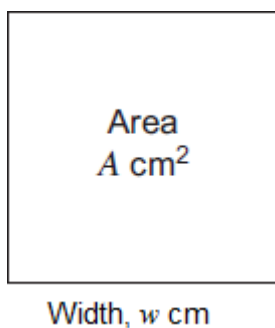
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.....

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(2)  
(Total 4 marks)

**Q12.** The diagram shows a square piece of card.



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

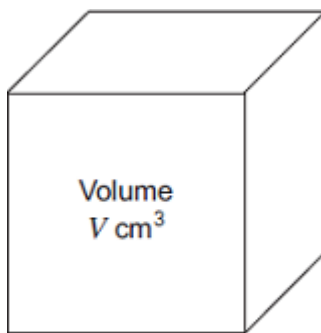
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Answer .....

(1)

(b) This diagram shows a cube.





Width,  $w$  cm

Write down a formula connecting  $V$  and  $w$ .

.....

Answer .....

(1)

(c) The area of one face of a cube is  $20 \text{ cm}^2$ .

Work out the volume of the cube.

.....

.....

.....

Answer .....  $\text{cm}^3$

(3)

(Total 5 marks)

**Q13.** Work out the value of  $4x + 3y$  when  $x = -2$  and  $y = 5$

.....

.....

.....

Answer .....

(Total 2 marks)

**Q14.** Complete the formula for each of the following.

The area,  $A$  ( $\text{cm}^2$ ), of a square of side  $x$  (cm) is  $A = \dots\dots\dots$

The volume,  $V$  ( $\text{cm}^3$ ), of a cube of side  $y$  (cm) is  $V = \dots\dots\dots$

**(Total 2 marks)**

**Q15.**  $A = \frac{4x + 3y}{x - y}$

Work out the value of  $A$  when  $x = 6$  and  $y = -1$

.....  
.....  
.....  
.....

Answer .....

**(Total 3 marks)**