

# TARGET B PAPER

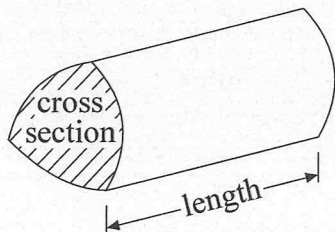
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## GCSE Mathematics (Linear) 2540

Formulae: Higher Tier

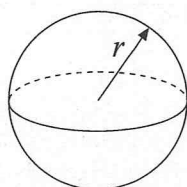
**You must not write on this formulae page.**  
**Anything you write on this formulae page will gain NO credit.**

**Volume of a prism** = area of cross section  $\times$  length



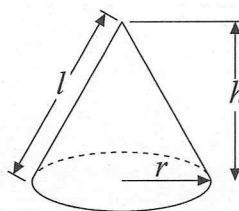
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**Surface area of sphere** =  $4\pi r^2$

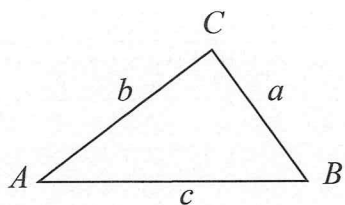


**Volume of cone** =  $\frac{1}{3}\pi r^2 h$

**Curved surface area of cone** =  $\pi r l$



**In any triangle ABC**



**The Quadratic Equation**

The solutions of  $ax^2 + bx + c = 0$

where  $a \neq 0$ , are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**Sine Rule**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

**Cosine Rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

**Area of triangle** =  $\frac{1}{2}ab \sin C$



Answer ALL TWENTY EIGHT questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1. Here are the ingredients needed to make 8 pancakes.

<p><b>Pancakes</b>          Ingredients to make 8 pancakes</p> <p>300 ml milk          1 egg          120 g flour          5 g butter</p>
---

Jacob makes 24 pancakes.

(a) Work out how much milk he needs.

..... ml  
(2)

Cathie makes 12 pancakes.

(b) Work out how much flour she needs.

..... g  
(2)

Q1

(Total 4 marks)



2. Kaysha has a part-time job.  
She is paid £5.40 for each hour she works.  
Last week Kaysha worked for 24 hours.

Work out Kaysha's total pay for last week.

£ .....

Q2

(Total 3 marks)

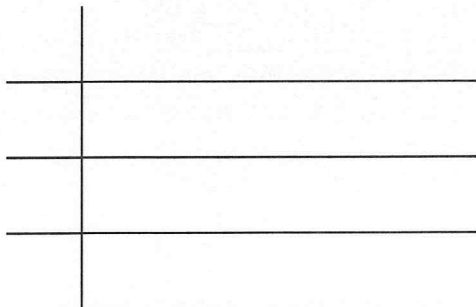
3. Here are the ages, in years, of 15 teachers.

35 52 42 27 36

23 31 41 50 34

44 28 45 45 53

Draw an ordered stem and leaf diagram to show this information.  
You must include a key.



Key:

Q3

(Total 3 marks)



4. Using the information that

$$4.8 \times 34 = 163.2$$

write down the value of

(a)  $48 \times 34$

.....  
(1)

(b)  $4.8 \times 3.4$

.....  
(1)

(c)  $163.2 \div 48$

.....  
(1)

(Total 3 marks)

Q4

5.

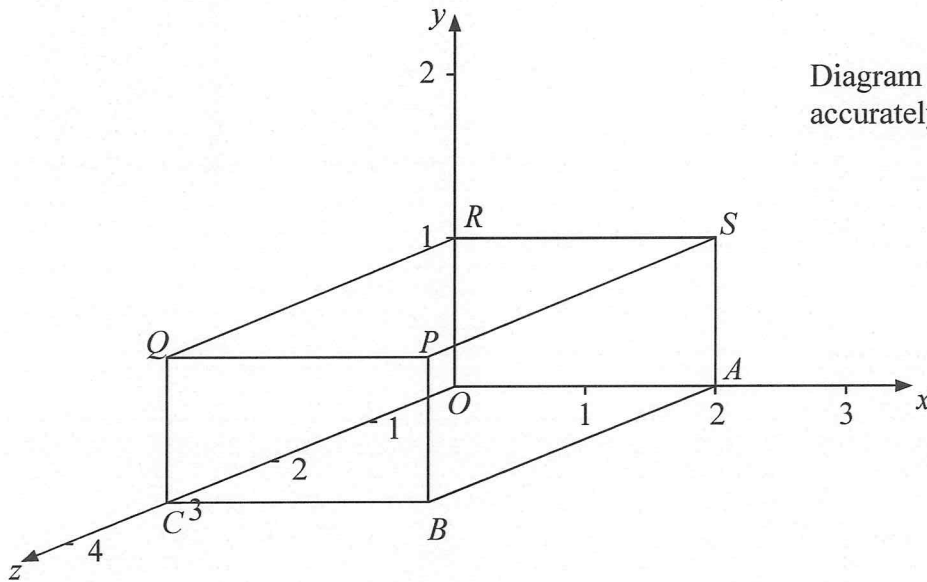


Diagram NOT accurately drawn

A cuboid is shown on a 3-dimensional grid.

(a) Write down the letter of the point with coordinates (2, 1, 0).

.....  
(1)

(b) Write down the coordinates of the point P.

( ..... , ..... , ..... )  
(1)

(Total 2 marks)

Q5



6. This rule is used to work out the total cost, in pounds, of hiring a carpet cleaner.

Multiply the number of days' hire by 4  
Add 6 to your answer

Peter hires a carpet cleaner.  
The total cost is £18

(a) Work out for how many days he hires the carpet cleaner.

..... days  
(2)

(b) Write down an expression, in terms of  $n$ , for the total cost, in pounds, of hiring a carpet cleaner for  $n$  days.

.....  
(2)

Q6

**(Total 4 marks)**



7.

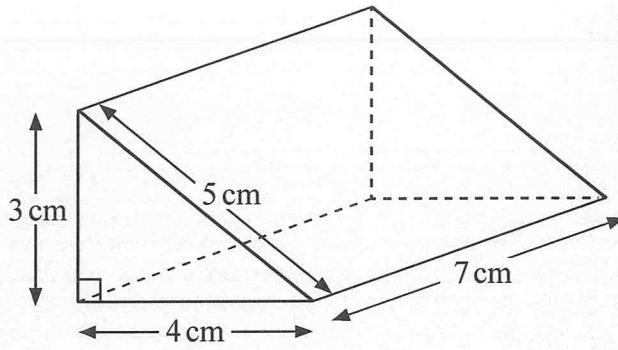


Diagram NOT accurately drawn

Work out the total surface area of the triangular prism.  
Give the units with your answer.

.....

**(Total 4 marks)**

Q7

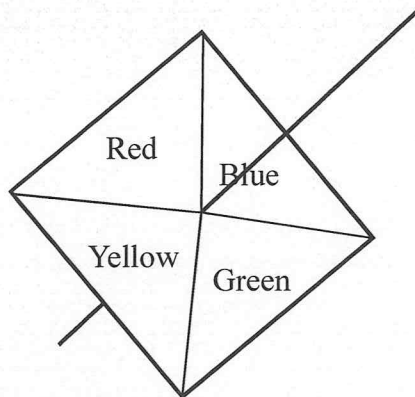


8. Work out an estimate for  $\frac{302 \times 9.96}{0.51}$

Q8

.....  
(Total 3 marks)

9. Here is a 4-sided spinner.



The sides of the spinner are labelled Red, Blue, Green and Yellow.

The spinner is biased.

The table shows the probability that the spinner will land on each of the colours Red, Yellow and Green.

Colour	Red	Blue	Green	Yellow
Probability	0.2		0.3	0.1

Work out the probability the spinner will land on Blue.

Q9

.....  
(Total 2 marks)





10. (a) Simplify  $4p \times 5q$

.....  
(1)

(b) Simplify  $d \times d \times d \times d$

.....  
(1)

(c) Expand  $4(3a - 7)$

.....  
(2)

(d) Expand and simplify  $2(2n + 3) + 3(n + 1)$

.....  
(2)

(e) Simplify  $t \times t^2$

.....  
(1)

(f) Simplify  $m^5 \div m^3$

.....  
(1)

(Total 8 marks)

Q10



Answer ALL TWENTY SIX questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1. The two-way table gives some information about how 100 children travelled to school one day.

	Walk	Car	Other	Total
Boy	15		14	54
Girl		8	16	
Total	37			100

- (a) Complete the two-way table.

(3)

One of the children is picked at random.

- (b) Write down the probability that this child walked to school that day.

.....  
(1)

Q1

(Total 4 marks)

2. (a) Simplify  $4x + 3y - 2x + 5y$

.....  
(2)

Compasses cost  $c$  pence each.

Rulers cost  $r$  pence each.

- (b) Write down an expression for the total cost, in pence, of 2 compasses and 4 rulers.

..... pence  
(2)

Q2

(Total 4 marks)

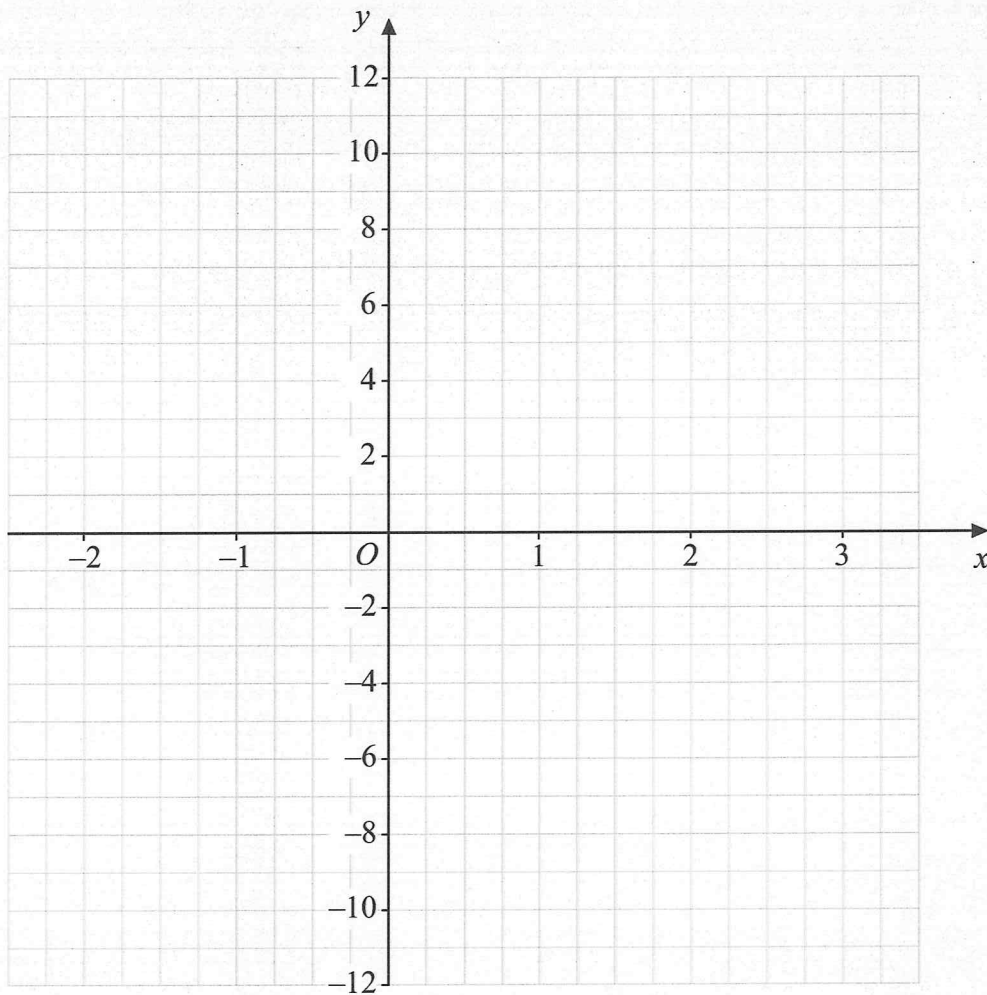


3. (a) Complete the table of values for  $y = 4x - 3$

$x$	-2	-1	0	1	2	3
$y$	-11		-3			9

(2)

- (b) On the grid, draw the graph of  $y = 4x - 3$ , for values of  $x$  from -2 to 3



(2)

Q3

(Total 4 marks)



4.  $P = 4k - 10$

$P = 50$

(a) Work out the value of  $k$ ......  
(2)

$y = 4n - 3d$

$n = 2$

$d = 5$

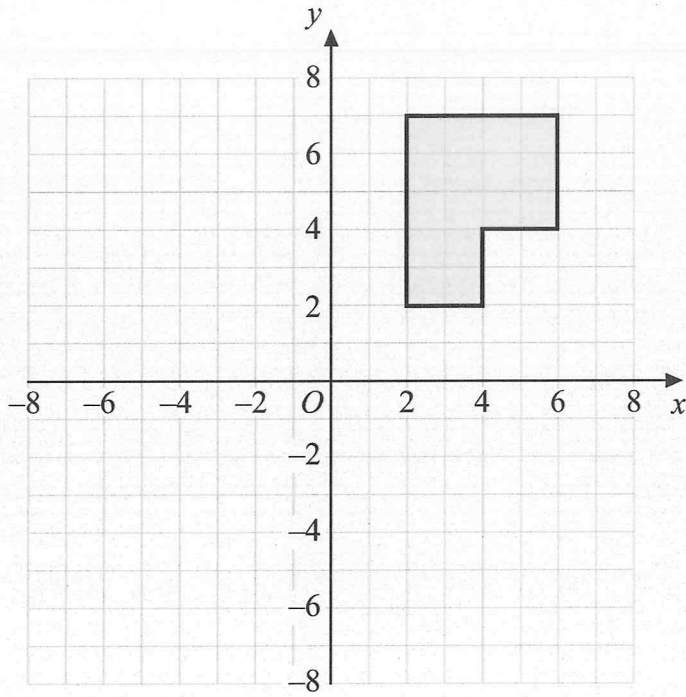
(b) Work out the value of  $y$ ......  
(2)

Q4

(Total 4 marks)

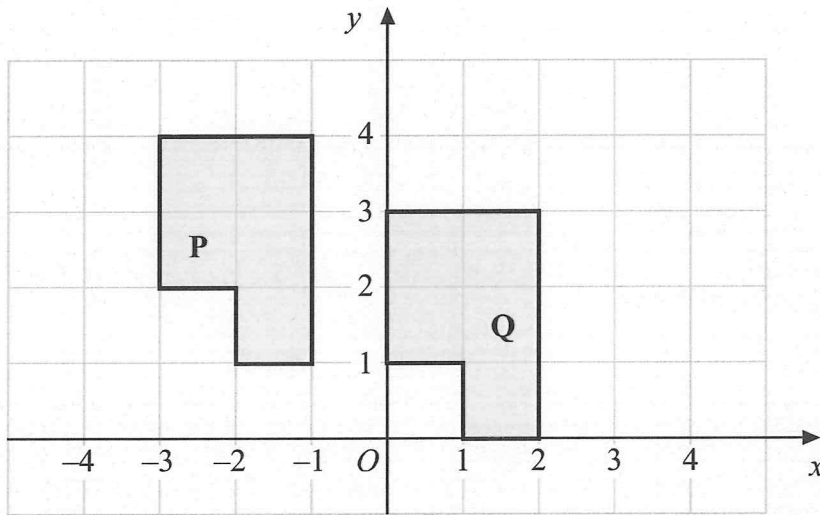


5.



(a) Rotate the shaded shape  $90^\circ$  clockwise about the point  $O$ .

(2)



(b) Describe fully the single transformation that will map shape P onto shape Q.

.....

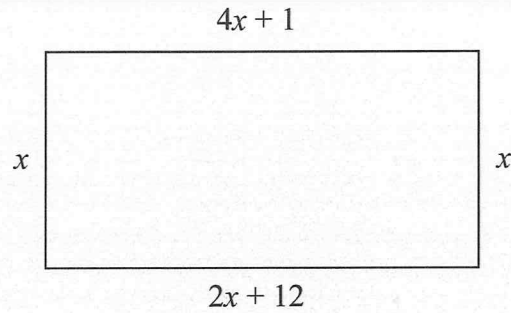
(2)

Q5

(Total 4 marks)



6.

Diagram NOT  
accurately drawn

The diagram shows a rectangle.  
All the measurements are in centimetres.

(a) Explain why  $4x + 1 = 2x + 12$

..... (1)

(b) Solve  $4x + 1 = 2x + 12$

$x =$  ..... (2)

(c) Use your answer to part (b) to work out the perimeter of the rectangle.

..... cm (2)

(Total 5 marks)

Q6



7. Use the information that

$$322 \times 48 = 15\,456$$

to find the value of

(a)  $3.22 \times 4.8$

.....  
(1)

(b)  $0.322 \times 0.48$

.....  
(1)

(c)  $15\,456 \div 4.8$

.....  
(1)

(Total 3 marks)

Q7

8.  $2x^2 = 72$

(a) Find a value of  $x$ .

.....  
(2)

(b) Express 72 as a product of its prime factors.

.....  
(2)

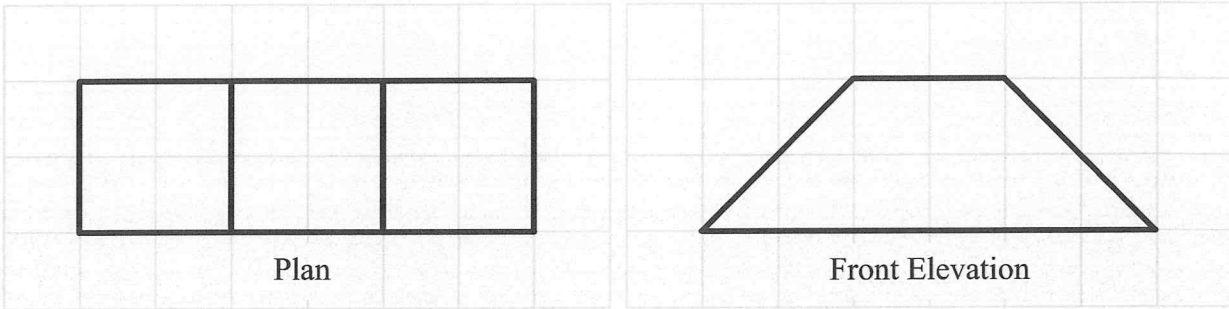
(Total 4 marks)

Q8

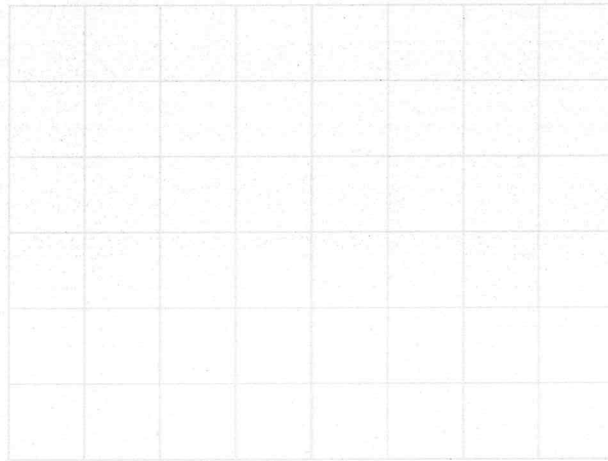




9. Here are the plan and front elevation of a solid shape.



(a) On the grid below, draw the side elevation of the solid shape.



(2)

(b) In the space below, draw a sketch of the solid shape.

(2)

Q9

(Total 4 marks)





**Answer ALL questions.**

**Write your answers in the spaces provided.**

**You must write down all stages in your working.**

**You must NOT use a calculator.**

**1** Sam wants to find out the types of film people like best.

He is going to ask whether they like comedy films or action films or science fiction films or musicals best.

(a) Design a suitable table for a data collection sheet he could use to collect this information.

(2)

Sam collects his data by asking 10 students in his class at school.  
This might **not** be a good way to find out the types of film people like best.

(b) Give **one** reason why.

(1)

**(Total for Question 1 is 3 marks)**



- 2 The diagram shows a patio in the shape of a rectangle.

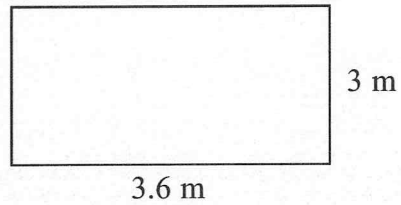


Diagram NOT  
accurately drawn

The patio is 3.6 m long and 3 m wide.

Matthew is going to cover the patio with paving slabs.  
Each paving slab is a square of side 60 cm.

Matthew buys 32 of the paving slabs.

- (a) Does Matthew buy enough paving slabs to cover the patio?  
You must show all your working.

.....  
(3)

The paving slabs cost £8.63 each.

- (b) Work out the total cost of the 32 paving slabs.

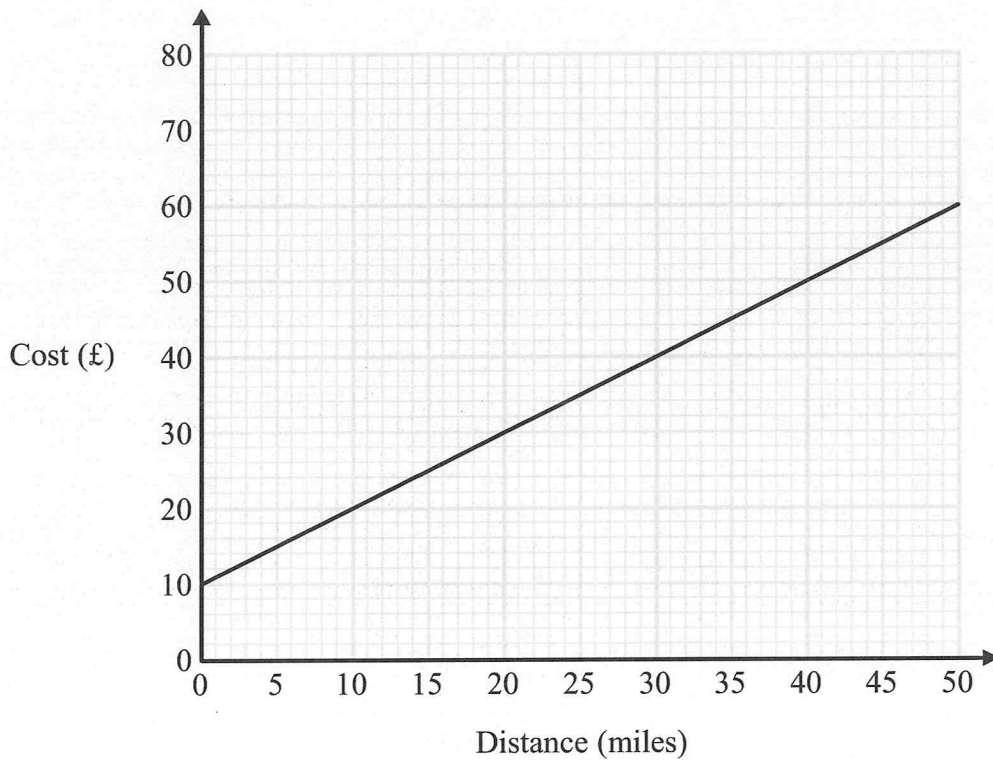
£ .....  
(3)

(Total for Question 2 is 6 marks)



- \*3 Bill uses his van to deliver parcels.  
For each parcel Bill delivers there is a fixed charge plus £1.00 for each mile.

You can use the graph to find the total cost of having a parcel delivered by Bill.



- (a) How much is the fixed charge?

£ .....

(1)

Ed uses a van to deliver parcels.  
For each parcel Ed delivers it costs £1.50 for each mile.  
There is **no** fixed charge.

- (b) Compare the cost of having a parcel delivered by Bill with the cost of having a parcel delivered by Ed.

(3)

(Total for Question 3 is 4 marks)



4 Here are the speeds, in miles per hour, of 16 cars.

31	52	43	49	36	35	33	29
54	43	44	46	42	39	55	48

Draw an ordered stem and leaf diagram for these speeds.

**(Total for Question 4 is 3 marks)**



5



You can work out the amount of medicine,  $c$  ml, to give to a child by using the formula

$$c = \frac{ma}{150}$$

$m$  is the age of the child, in months.

$a$  is an adult dose, in ml.

A child is 30 months old.

An adult's dose is 40 ml.

Work out the amount of medicine you can give to the child.

..... ml

(Total for Question 5 is 2 marks)



6 Here are the ingredients needed to make 12 shortcakes.

**Shortcakes**

Makes 12 shortcakes

50 g of sugar  
200 g of butter  
200 g of flour  
10 m/ of milk

Liz makes some shortcakes.  
She uses 25 m/ of milk.

(a) How many shortcakes does Liz make?

.....  
(2)

Robert has      500 g of sugar  
                     1000 g of butter  
                     1000 g of flour  
                     500 m/ of milk

(b) Work out the greatest number of shortcakes Robert can make.

.....  
(2)

**(Total for Question 6 is 4 marks)**



- 7 Buses to Acton leave a bus station every 24 minutes.  
Buses to Barton leave the same bus station every 20 minutes.

A bus to Acton and a bus to Barton both leave the bus station at 9 00 am.

When will a bus to Acton and a bus to Barton next leave the bus station at the same time?

.....  
(Total for Question 7 is 3 marks)

- 8 (a) Expand  $3(2y - 5)$

.....  
(1)

- (b) Factorise completely  $8x^2 + 4xy$

.....  
(2)

- (c) Make  $h$  the subject of the formula

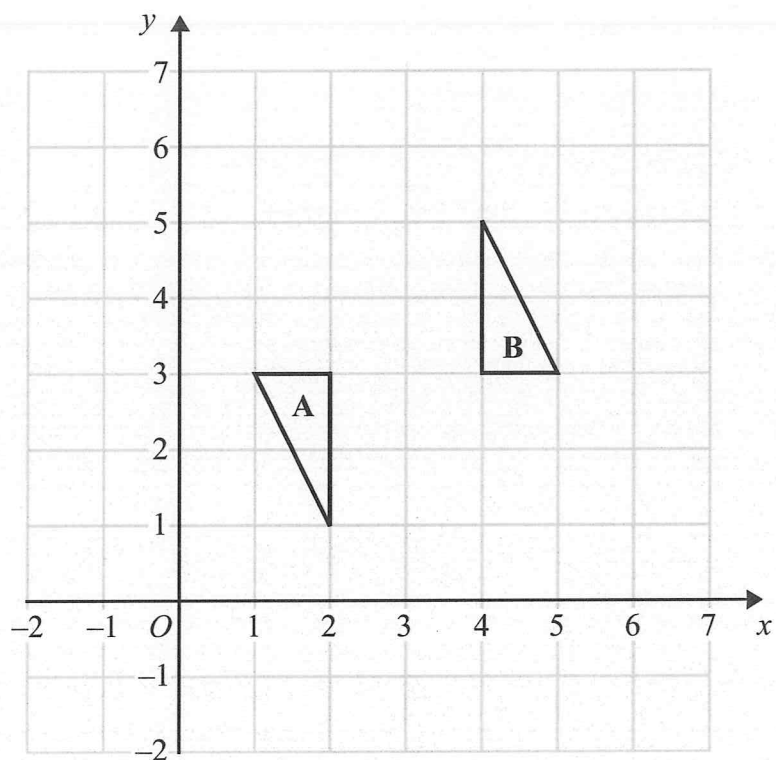
$$t = \frac{gh}{10}$$

$h =$  .....  
(2)

(Total for Question 8 is 5 marks)



9



Describe fully the single transformation that maps triangle A onto triangle B.

.....

.....

(Total for Question 9 is 3 marks)

