

Name \_\_\_\_\_

Candidate Number \_\_\_\_\_

Room Number \_\_\_\_\_

# WITHINGTON GIRLS' SCHOOL

## ENTRANCE EXAMINATION 2018

### MATHEMATICS

### PAPER 2

TIME: 40 MINUTES

- Some questions in this paper involve new ideas, but there are examples to guide you and help you understand these new ideas.
- Look at the examples carefully and try to answer all the questions.
- If you cannot answer a question, leave it and go on to the next one.
- Use any time you have left to check your answers and go back to any questions you have left out.

**CALCULATORS MUST NOT BE USED**

PAPER 2 TOTAL		
Marker's Initials		
Checker's Initials		

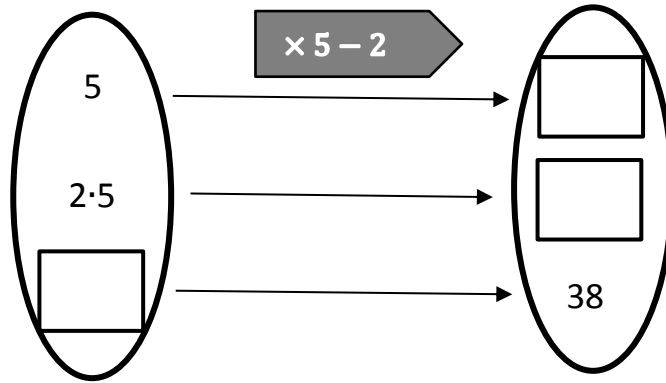
1. Write down the next two numbers in the sequence

3 4 6 9 13 \_\_\_\_\_

1

1

2. Find the missing inputs and outputs



1

1

1

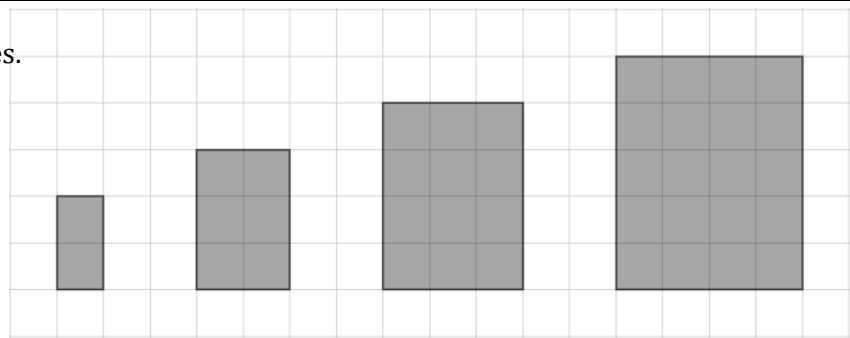
3. Adam and Claire buy some tickets for a concert.  
Adam spends £93 and buys 6 tickets.  
Claire spends £124, how many tickets does she buy?

1

1

\_\_\_\_\_ tickets

4. Look at this sequence of rectangles.



Rectangle Number	1	2	3	4
Area (squares)	$1 \times 2 = 2$	$2 \times 3 = 6$	$3 \times 4 = 12$	$4 \times 5 = 20$

(a) What is area of the 10<sup>th</sup> rectangle in the pattern?

\_\_\_\_\_ squares

1

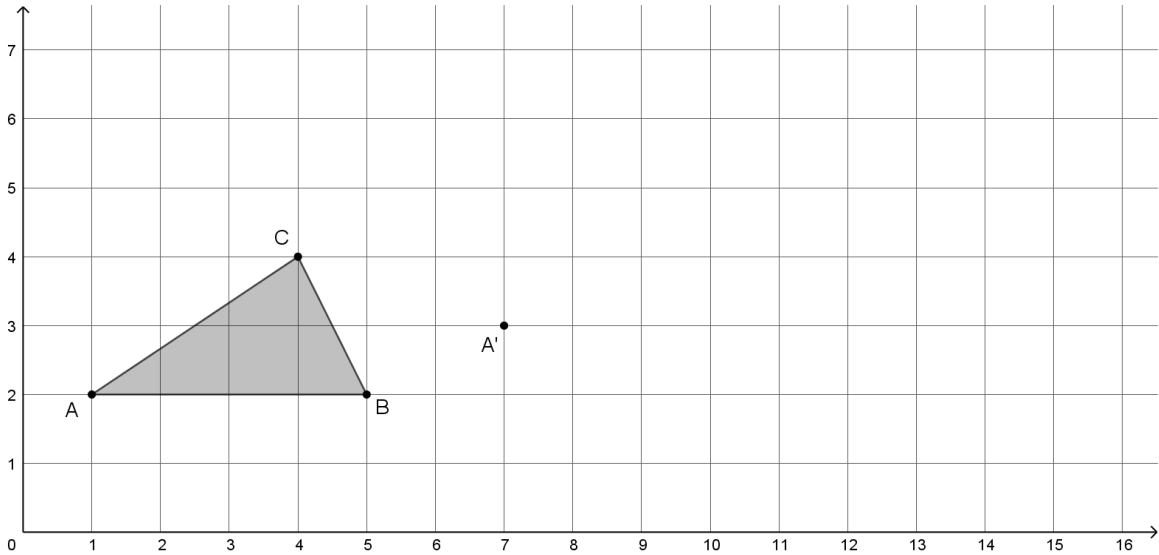
(b) One of the rectangles has an area of 420 squares. What is its rectangle number?

\_\_\_\_\_

1

1

5. The triangle ABC is enlarged by a scale factor of 2, to make triangle A'B'C'. Where A' is the image of A, B' is the image of B and C' is the image of C. A' has already been drawn.



(a) Complete the enlarged triangle and label the corners B' and C'.

(b) What is the coordinate of C'?

C = (     ,     )

1  
1

1

6. Liana has £24 of pocket money saved. She spends one third of her savings on a DVD and 25% of the remainder on a book. How much does she have left?

£ \_\_\_\_\_

1  
1  
1

7. Form 7X raised £165 for Oxfam by selling cakes for 75 pence each. How many cakes did they sell?

\_\_\_\_\_

1  
1

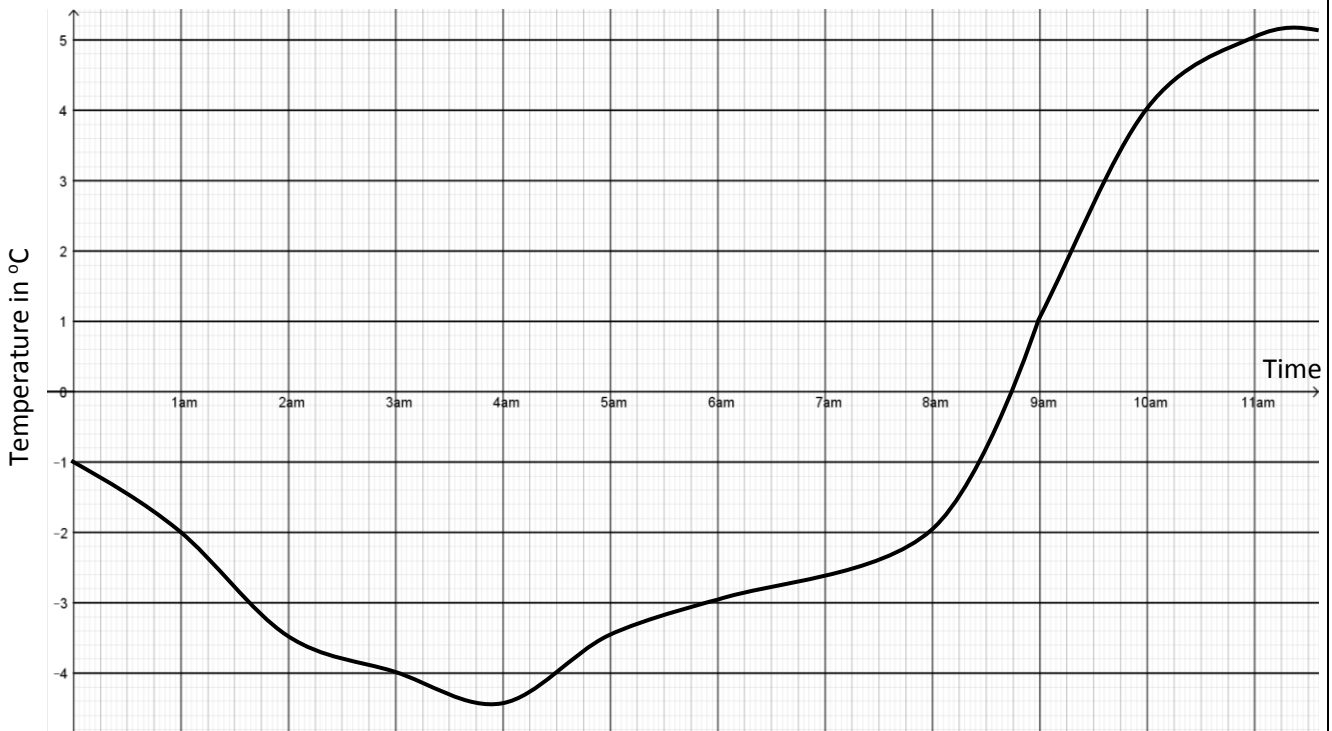
8. Each hour a grandfather clock strikes the number of hours. How many strikes would there be in 12 hours?



\_\_\_\_\_

1  
1

9. The graph shows the temperature in Withington on New Year's Day 2018 between midnight and 11am



- (a) What was the temperature at 6 am? \_\_\_\_\_ °C 1
- (b) When was the temperature -2°C for the second time? \_\_\_\_\_ a.m. 1
- (c) What was the difference in temperature between 6 a.m. and 11 a.m.? \_\_\_\_\_ °C 1
- (d) In which hour was the greatest drop in temperature? Between \_\_\_\_\_ a.m. and \_\_\_\_\_ a.m. 1

10. Fill in the missing gaps

- (a) 25% of 32 =  % of 40
- (b) 40% of 35 = 50% of
- (c)  $\frac{3}{8}$  of 16 =  $\frac{2}{9}$  of

11. Brackets are used to show which part of a calculation should be completed first.  
For example

$$3 \times (4 + 5) = 3 \times 9 = 27$$

Put brackets in the following to make the calculation correct.

(a)  $2 \times 3^2 - 4 = 10$

(b)  $4 \times 5 - 3 \times 3 = 24$

1  
1

12. Rebekah, Abigail and Anna are revising for their Withington entrance examination.  
Here are the times it takes each girl to complete each question:

- Rebekah 4 minutes
- Abigail 8 minutes
- Anna 6 minutes

At 9 am the girls start working through a 20 question practice paper.

(a) When Abigail has finished question 9, how many questions has Anna completed?

1  
1

\_\_\_\_\_

(b) At what time will Rebekah complete all the questions?

1

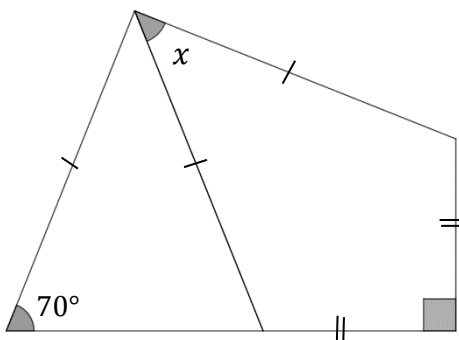
\_\_\_\_\_

(c) At a certain time all girls will finish a question at the same time.  
Give one possible time when this could happen.

1  
1

\_\_\_\_\_

13. Find the value of  $x$ .



1  
1  
1  
0

\_\_\_\_\_

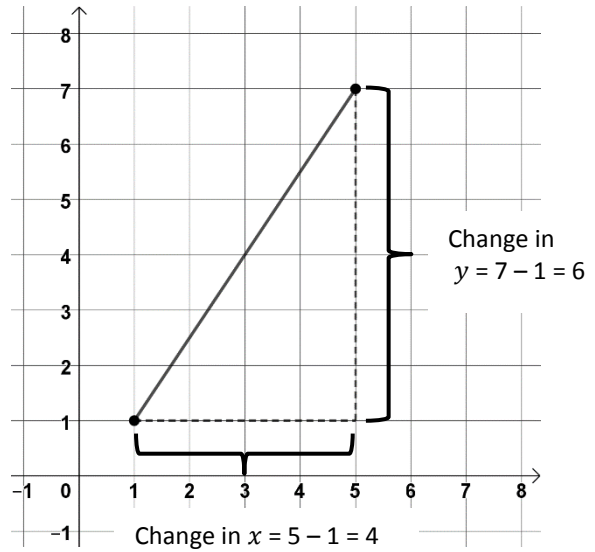
PLEASE TURN OVER

14. The gradient of a line is a measure of its steepness.

$$\text{gradient} = \frac{\text{change in } y \text{ coordinate}}{\text{change in } x \text{ coordinate}}$$

For example, the calculation below shows how to find the gradient of the line joining (1, 1) and (5, 7) shown in the diagram.

$$\begin{aligned} \text{gradient} &= \frac{6}{4} \\ &= \frac{3}{2} \\ &= 1.5 \end{aligned}$$



(a) Work out the gradient of the line joining (0, 2) and (4, 10).  
The grid at the bottom of the page might be helpful.

1

1

\_\_\_\_\_

(b) The gradient of the line joining (3, 4) and (5,  $p$ ) is 6. Find the value of  $p$ .

1

1

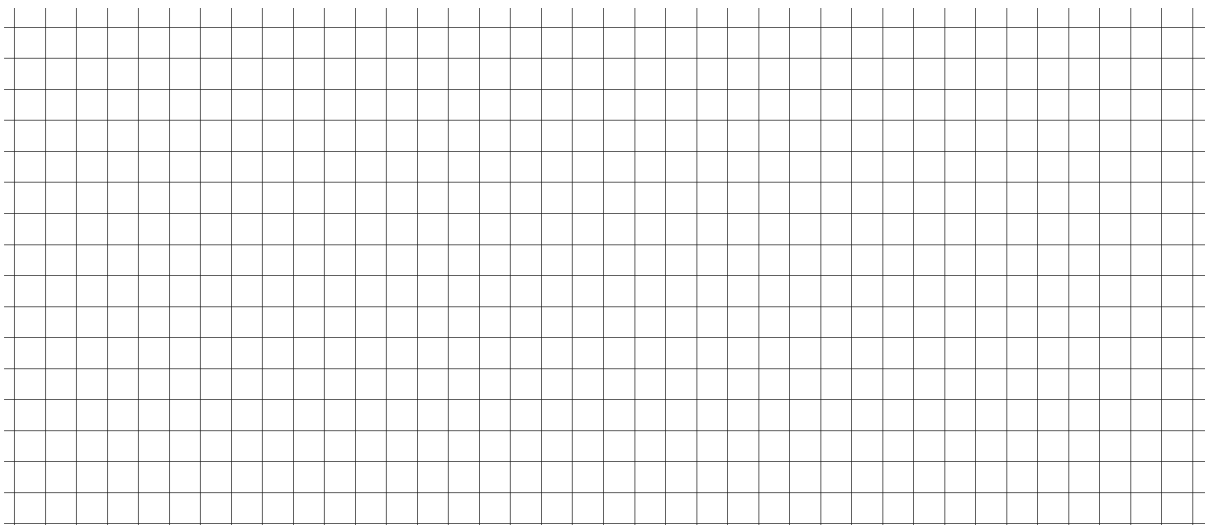
$p =$  \_\_\_\_\_

(c) The gradient of the line joining ( $q$ , 2) and (7, 11) is 4.5. Find the value of  $q$ .

1

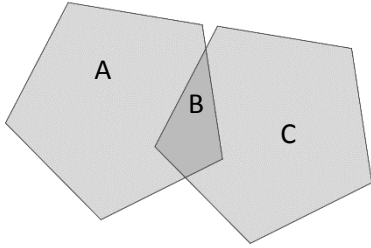
1

$q =$  \_\_\_\_\_



15. In this question all the pentagons are identical. Each pentagon has an area of  $60 \text{ cm}^2$ . Two pentagons overlap to make 3 regions A, B (the overlap) and C.

For example

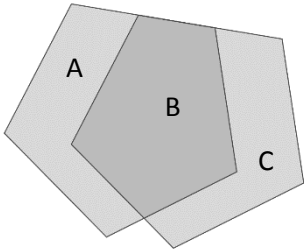


In this diagram the pentagons overlap by 10%.

To work out the total area  $(A+B+C)$

$$\begin{aligned} \text{Area} &= \text{pentagon } (A+B) + 90\% \text{ of pentagon } (C) \\ &= 60 + 54 \\ &= 114 \end{aligned}$$

(a)



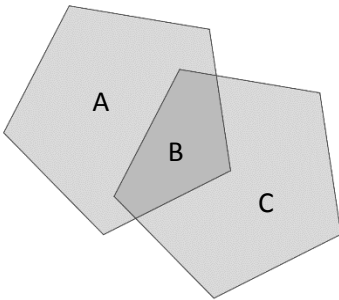
These pentagons overlap by 60%. Find the total area.

1

1

\_\_\_\_\_  $\text{cm}^2$

(b)



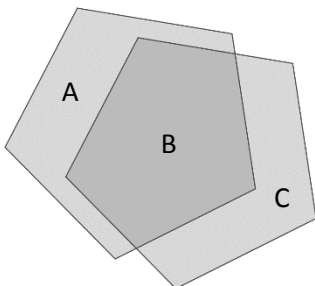
In this diagram C is equal to  $45 \text{ cm}^2$ . Find the total area.

1

1

\_\_\_\_\_  $\text{cm}^2$

(c)



The total area  $(A+B+C)$  is  $75 \text{ cm}^2$ . Find the percentage overlap.

1

1

\_\_\_\_\_ %

16. 25% of the girls at Withington are left handed. One tenth of the left handed students play tennis. There are 16 left handed tennis players at Withington. How many pupils are there in total?

1  
1

\_\_\_\_\_

17. The length of the rectangle is 6 cm more than the width. The perimeter is 24 cm. Find the length and the width.



1  
1

\_\_\_\_\_ and \_\_\_\_\_

18. At Withington's Maths shop you can buy:  
3 protractors and 5 rulers for £1.55  
6 protractors and 9 rulers for £2.88  
Find the cost of one protractor and one ruler.

1  
1  
1

Protractor = \_\_\_\_\_ pence

Ruler = \_\_\_\_\_ pence

19. Ellie has entered a skating competition which is judged by five people. To win, Ellie needs an average (mean) score of at least 8.5. The first four judges award Ellie

7.9    8.3    8.8    8.6

What is the lowest score the final judge could award for Ellie to win?

1  
1  
1

\_\_\_\_\_

END OF TEST – NOW CHECK YOUR WORKING