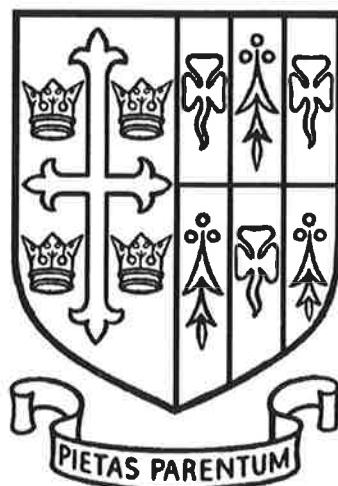


**ST EDWARD'S
OXFORD**



**13+ SCHOLARSHIP EXAMINATION
2018**

**MATHEMATICS
PAPER I**

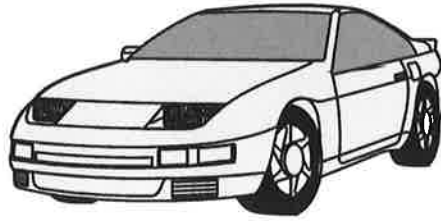
1 hour

Answer all questions.

Calculators are NOT permitted.

Name: _____

1. Ben bought a car for £12 000.



Each year the value of the car depreciated by 10%.

Work out the value of the car two years after he bought it.

£

(Total 3 marks)

2. On average, Nick walks 18 000 steps every day.
He walks 1 mile approximately every 3500 steps.

Work out an estimate for the average distance, in miles, that Nick walks **in one year**.

..... miles

(Total 3 marks)

3. A full glass of water holds $\frac{1}{6}$ of a bottle of water.

How many glasses of water can be filled from $2\frac{1}{2}$ bottles of water?

.....
(Total 3 marks)

4. John says "For all prime numbers, n , the value of $n^2 + 3$ is always an even number".
Give an example to show that John is **not** correct.

(Total 2 marks)

5. (a) Solve $7p + 2 = 5p + 8$

$p = \dots\dots\dots$ (2)

- (b) Solve $7r + 2 = 5(r - 4)$

$r = \dots\dots\dots$ (2)
(Total 4 marks)

6. (a) Simplify

(i) $3g + 5g$

.....

(ii) $2r \times 5p$

.....

(2)

(b) Expand $5(2y - 3)$

.....

(1)

(c) Expand and simplify

$2(3x + 4) - 3(4x - 5)$

.....

(2)

(Total 5 marks)

7. Prove algebraically that the sum of the squares of any two odd numbers leaves a remainder of 2 when divided by 4.

(Total 3 marks)

8. Nassim thinks of a number.
When he multiplies his number by 5 and subtracts 16 from the result, he gets the same answer as when he adds 10 to his number and multiplies that result by 3.

Find the number Nassim is thinking of.

.....
(Total 4 marks)

9. Kate buys 2 lollies and 5 choc ices for £6.50
Pete buys 2 lollies and 3 choc ices for £4.30

Work out the cost of one lolly.
Give your answer in pence.

..... pence
(Total 3 marks)

10. The table shows some rows of a number pattern.

Row 1	$2^2 - 0^2 = 4 = 4 \times 1$
Row 2	$3^2 - 1^2 = 8 = 4 \times 2$
Row 3	$4^2 - 2^2 = 12 = 4 \times 3$
Row 4	

- (a) Complete Row 4 of the number pattern.

(1)

- (b) Use the number pattern to find the answer to $121^2 - 119^2$

.....
(2)
(Total 3 marks)

11. Here are the first 4 lines of a number pattern.

$1 + 2 + 3 + 4$	$=$	$(4 \times 3) - (2 \times 1)$
$2 + 3 + 4 + 5$	$=$	$(5 \times 4) - (3 \times 2)$
$3 + 4 + 5 + 6$	$=$	$(6 \times 5) - (4 \times 3)$
$4 + 5 + 6 + 7$	$=$	$(7 \times 6) - (5 \times 4)$

n is the first number in the n th line of the number pattern.

Show that the above number pattern is true for the four consecutive integers

$n, (n + 1), (n + 2)$ and $(n + 3)$

(Total 4 marks)

12. (a) Solve $\frac{3}{x} + \frac{3}{2x} = 2$

$x = \dots\dots\dots$ (2)

(b) Using your answer to part (a), or otherwise,

solve $\frac{3}{(y-1)^2} + \frac{3}{2(y-1)^2} = 2$

$y = \dots\dots\dots$
or $y = \dots\dots\dots$ (3)
(Total 5 marks)

13.

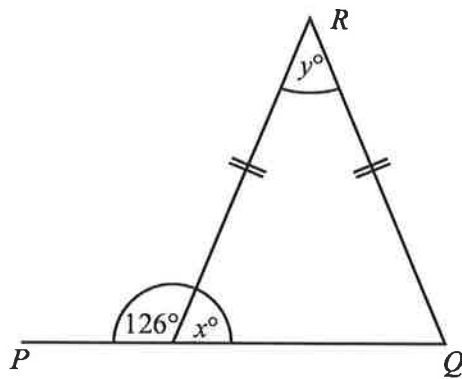


Diagram **NOT** accurately drawn

PQ is a straight line.

(a) Work out the size of the angle marked x° .

.....^o

(1)

(b) (i) Work out the size of the angle marked y° .

.....^o

(ii) Give reasons for your answer.

.....

.....

(3)
(Total 4 marks)

14.

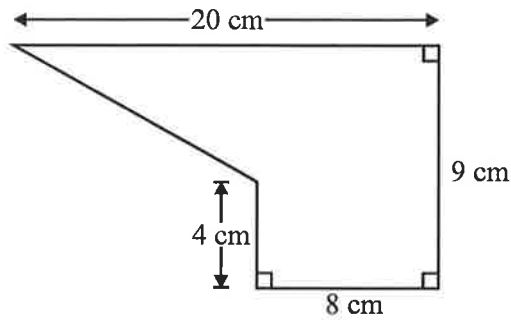
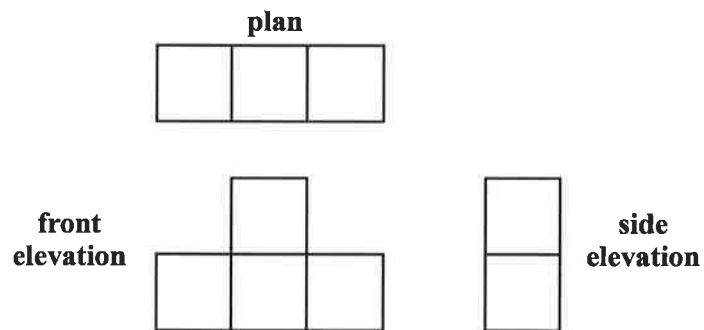


Diagram **NOT** accurately drawn

The diagram shows a shape.
Work out the area of the shape.

..... cm^2
(Total 4 marks)

15. Here are the plan, front elevation and side elevation of a 3-D shape.



In the space below, draw a sketch of the 3-D shape.

(Total 2 marks)

16. 20 students scored goals for the school hockey team last month.
The table gives information about the number of goals they scored.

Goals scored	Number of students	
1	9	
2	3	
3	5	
4	3	

- (a) Write down the modal number of goals scored.

.....

(1)

- (b) Work out the range of the number of goals scored.

.....

(1)

- (c) Work out the mean number of goals scored.

.....

(3)

(Total 5 marks)

17. Siân wants to collect information about the different ways in which students travel to school.

Design a suitable data collection sheet that Siân could use to collect the information.

(Total 3 marks)

END OF EXAM