Name:_____

Age:_____Yrs_____Mths

Group Number:_____

ST PAUL'S
GIRLS' SCHOOL

FIRST YEAR ENTRANCE EXAMINATION

MATHEMATICS

Paper 1

35 minutes

PLEASE READ THESE INSTRUCTIONS VERY CAREFULLY

Use a pencil. No calculators, protractors or rulers are allowed.

There are two sections. The invigilator will tell you when you should begin Section 2.

Section 1 is multiple choice and does not require any workings.

Show all your workings in Section 2 and write your answers on the lines provided.

Please do not rub out your workings.

If you cannot do a question, leave it and go on to the next one. Try again later.

You cannot ask a teacher for explanations.

If you finish before the end of 35 minutes go back and check your answers.
Try to complete any questions you have left out.

Section 1 – Questions

1 What is the missing number: $[\quad] + 121 = 212$

A 101 B 84 C 99 D 91 E 111

2 Calculate $37 \times 4 \times 5$

A 148 B 370 C 740 D 500 E 435

3 What is the missing number?

$$\frac{\quad}{16} = \frac{18}{24}$$

A 3 B 12 C 13 D 14 E 18

4 Eight pencils cost £1. How much do 28 pencils cost?

A £3.00 B £3.36 C £3.50 D £3.56 E £3.70

5 Which is the smallest of these fractions?

A $\frac{7}{8}$ B $\frac{9}{2}$ C $\frac{7}{10}$ D $\frac{17}{20}$ E $\frac{7}{21}$

6 Calculate $483 \div 21$

A 21 B 22 C 23 D 24 E 25

7 How many of these fractions are between 2.2 and 2.6?

$2\frac{1}{7}$ $2\frac{6}{11}$ $2\frac{2}{5}$ $2\frac{1}{10}$

A 0 B 1 C 2 D 3 E 4

8 85 people go to the school concert. They pay £1.30 each.
How much money is collected?

A £130 B £115 C £110.50 D £121.50 E £125

9 Find 568×25.

A 15820 B 16950 C 11425 D 11360 E 14200

10 Find 25% of 380

A 95 B 88 C 97 D 76 E 94

Section 1 – Answers

Circle a letter to indicate your answer.

Question					
1	A	B	C	D	E
2	A	B	C	D	E
3	A	B	C	D	E
4	A	B	C	D	E
5	A	B	C	D	E
6	A	B	C	D	E
7	A	B	C	D	E
8	A	B	C	D	E
9	A	B	C	D	E
10	A	B	C	D	E

Section 2 – Questions

1) There are a number of coins on a table.
One quarter of the coins show heads.

If I turn over two coins, then one third show heads. How many coins are there altogether?

Answer .....coins

2) If 5 mugs cost £3.50 and 8 pens cost £6.80 how much change do I get from £10 if I buy 7 mugs and 5 pens? You MUST show your working.

Answer £.....

3) There are twenty gifts stacked up into four piles.
The first pile has 3 less than the second pile.
The second pile has two more than the third pile.
The fourth pile has twice as many as the second pile.

How many gifts are in each pile?

Answer ....., ..., ... and .....gifts

4) In *Mathsland* currency is arranged in alphas, betas and gammas where

1 Alpha=20 Betas and **1 Beta=5 Gammas**.

a) How many Gammas in 5 Alphas, 6 Betas and 3 Gammas?

Answer .....gammas

b) Using as many alphas as you can, and then betas, then gammas, how would you pay for something that costs 789 Gammas?

Answer .....alphas .....betas .....gammas

5) If the following statements are true, how many Σ s are there in a $\oplus$?

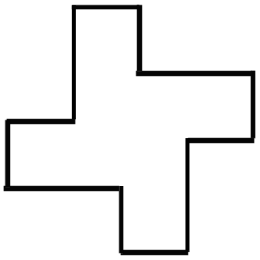
- $\Sigma + \Sigma = \Psi$
- $\Psi + \Psi + \Sigma = \Theta$
- $\Theta + \Psi = \oplus$

Answer ..... Σ 

6) A box of biscuits contains 36 biscuits. 20 biscuits have foil wrappers. 15 are chocolate biscuits with foil wrappers. If 9 are not chocolate and do not have a foil wrapper, then how many chocolate biscuits are there?

Answer ..... 

7)

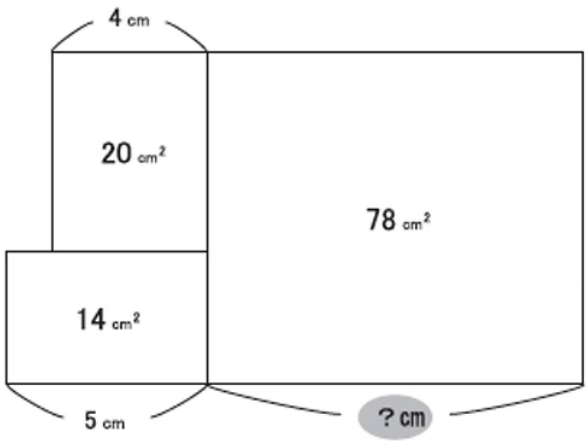


All the long edges of the shape above have the same length and each long edge is twice as long as each short edge. All angles are 90° or 270°. The area of the figure is 200cm^2.

What is the perimeter?

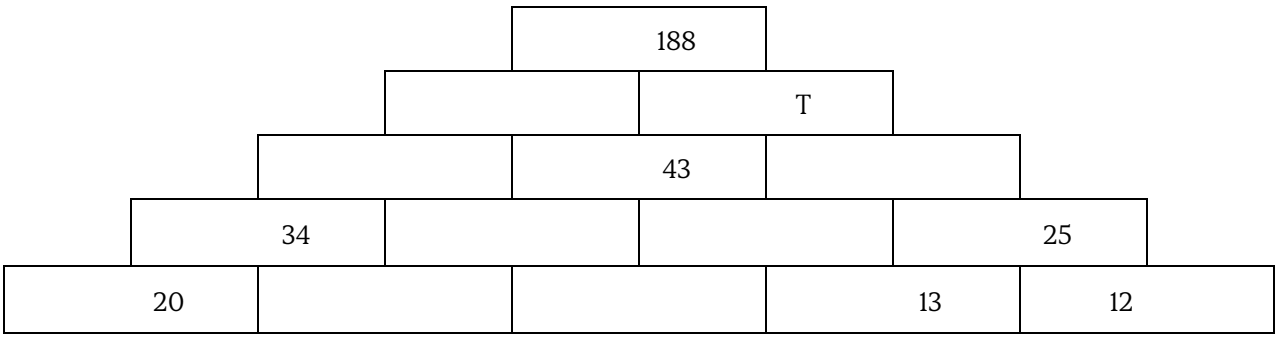
Answer .....cm

8) Using the fact that these shapes are all rectangular, work out the missing length.



Answer .....cm

9) In this number tower the value in each block is the sum of the two below it. What is the value of block T?



Answer .....

10) Jenny passes 40 electricity poles along the straight road from school to her home.

The distance between every 2 poles is 30 metres.

If her school is exactly half way between 2 poles and her home is also exactly halfway between 2 poles, then

(a) Find the distance from her school to her home in km.

Answer .....km

(b) If she walks at an average speed of $8\ km/h$, how long does it take her to get to school from home?

Answer .....

END OF SECTION 1. NOW GO BACK AND CHECK YOUR ANSWERS.

Candidate no:_____ Group Number:_____

ST PAUL'S
GIRLS' SCHOOL

FIRST YEAR ENTRANCE EXAMINATION

MATHEMATICS

Paper 2

40 minutes

PLEASE READ THESE INSTRUCTIONS VERY CAREFULLY

Use a pencil. No calculators, protractors or rulers are allowed.

There are 5 questions.

Show all your working in the spaces provided and write your answers on the lines provided.

Please do not rub out your working.

If you cannot do a question, leave it and go on to the next one.
Try again later.

Do not ask a teacher to explain a question to you.

If you finish before the end of 40 minutes go back and check your answers and try to fill in any answers you have left out.

1.

a. Mila adds odd numbers together and writes down her results as follows:

$$1 = 1 = 1^2$$
$$1 + 3 = 4 = 2^2$$
$$1 + 3 + 5 = 9 = 3^2$$

i. Write down the next three lines of this pattern:

Answer .....

.....

.....

ii. Using this pattern, write down the line which contains 169 at the centre.

..... = 169 = ...

b. Mila then adds different odd numbers and puts her results in a table again:

$$1 = 1 = 1^3$$
$$3 + 5 = 8 = 2^3$$
$$7 + 9 + 11 = 27 = 3^3$$

i. Write down the next three lines of this pattern:

Answer .....

.....

.....

ii. Using this pattern, **<u>how many</u>** numbers do you need to add together in the line with:

$$\ldots = 1000 = \ldots$$

Answer .....

c. Using your answers from parts a. and b. find three numbers A, B and C such that

$$A - B = C$$

and

$$A^2 - B^2 = C^3$$

Answer: $A =$ .....$B =$.....$C =$.....

2. The symbol ϕ represents a mathematical operation.
The rule for ϕ is "add the two numbers and then multiply their sum by the second number".
For example, $2 \phi 3 = (2 + 3) \times 3 = 5 \times 3 = 15$

Work out:

a. $2 \phi 6 =$

Answer .....

b. $\frac{1}{2} \phi 3 =$

Answer .....

c. $\frac{1}{4} \phi \frac{1}{2} =$

Answer .....

d. If $6 \phi m = 91$, what positive number must m be? Show all your working.

Answer .....

e. If $p \phi p = 72$, what number must p be? Show all your working.

Answer .....

f. Explain why $x \phi y$ is not the same as $y \phi x$.

Answer.....

.....

.....

.....

.....

.....

.....

.....

3. The diagram below shows a road network connecting the villages A to H. The numbers between the letters show how far apart the villages are in miles. A route connects two villages by travelling along the straight lines.
An example of a route from E to D is EF – FC – CD.

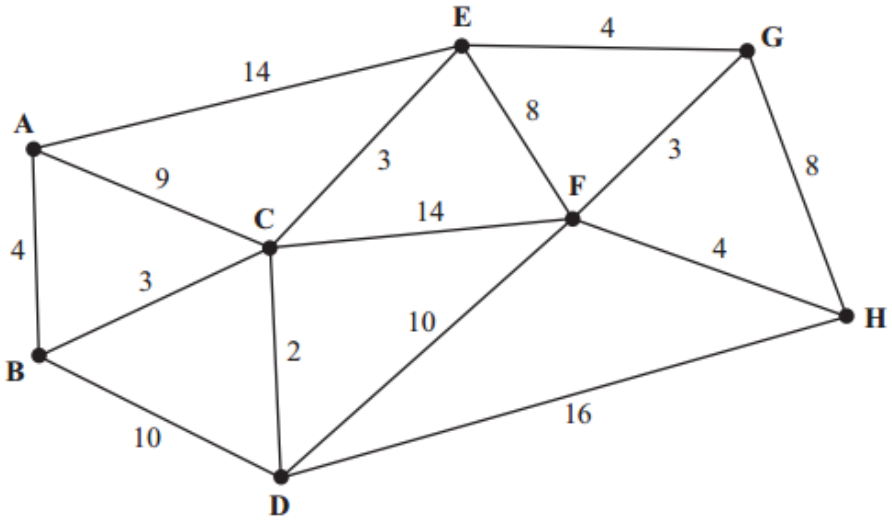


Diagram not to scale

a) What is the shortest route between A and E, and how long is it?

Answer: route.....

.....miles...

b) What is the shortest route between H and C, and how long is it?

Answer: route.....

.....miles...

c) What is the shortest route between A and H, and how long is it?

Answer: route.....

.....miles...

4. Eliza is calculating 32×37.
She has constructed this number pattern:

32×37
16×74
8×148

.....× 296

.....× .....

.....× .....

Fill in the missing numbers.

a. Explain how the pattern is made.

Answer

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

b. Using a similar method, work out 27×37.

27×37

.....× .....

.....× .....

.....× .....

c. Adapt this method to work out $972 \div 36$.

.....× .....

.....× .....

.....× .....

.....× .....

.....× .....

5. Tilly decides to count using a clock.
She starts counting from 1 in the normal way, so:

1, 2, 3, 4...

But when she gets to 12, the count goes back to 1, so she counts:

...8, 9, 10, 11, 12, 1, 2, 3...

So, for example, using this method of counting, $4 + 9 = 1$ and $10 + 5 = 3$. Similarly, $3 \times 5 = 3$ and $2 \times 13 = 2$.

a. Using this counting method, complete the following:

i. 3 + 4 =

Answer .....

ii. 7 + 8 =

Answer .....

iii. 9 + 11 =

Answer .....

iv. 7×8 =

Answer .....

v. 9×11 =

Answer .....

b. Using this counting method, can you find two different positive numbers n and m such that $n^2 = m^2$

Answer: n = ...m =.....

c. Using this method, can you find two different numbers p and q such that $p^3 = q^3$?

Answer: p = ...q =.....

END OF SECTION 2

NOW GO BACK AND CHECK YOUR ANSWERS