City of London School for Girls

YEAR 7 ENTRANCE EXAMINATION

MATHEMATICS

SAMPLE Paper

Time Allowed: 1 hour 15 minutes

First Name: ....

Surname: ....

Instructions:

- Do write in pencil
- Do try as many questions as you can
- If you cannot answer a question, go on to the next one
- Do write your working out in the space near each question
- Do not erase your working out as you may get marks for it
- Calculators and rulers are NOT allowed

- You will be given 35 minutes to complete section A.
  You will hand in section A before being given section B.
  You will then have 40 minutes to complete section B.

SECTION A

35 minutes

1) 3078 + 256

Don't forget the 1s in hand

$$
\begin{array}{r}
3078 \\
+\ 256 \\
\hline
3334 \\
\end{array}
$$

Answer: 3334

2) 3078 − 256

You can always check if you're correct by adding 2822 with 256 to see if you come back to 3078

$$
\begin{array}{r}
3078 \\
-\ 256 \\
\hline
2822 \\
\end{array}
$$

Answer: 2822

3) 158 x 23

When we multiply by a number in the tens place, we add a zero at the end, to show we are multiplying by 10

$$
\begin{array}{r}
158 \\
\times\ 23 \\
\hline
474 \\
3160 \\
\hline
3634 \\
\end{array}
$$

Answer: 3634

4) 3072 ÷ 12

Keep track of the remainders!

$$
12\overline{)3072} = 256
$$

Answer: 3072

5) What is the reading on the measuring cylinder
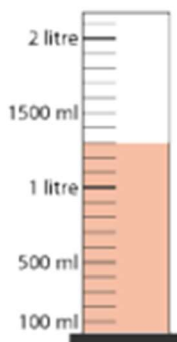
To answer this question, we need to see what each of the tiny intervals represent. As we can see there are **5** small intervals between **1 litre or 1000 ml** and **1500 ml**, which means each interval represents 100 ml. And since the liquid is **3 intervals above 1 litre**, that means the answer will be **1000 + (3 X 100) = 1300 ml**

Answer: .... 1300 .... ml

6) What number is twelve less than eight thousand two hundred and seven?

You can also subtract the number by 7 first then 5 for an easier calculation as 7 + 5 = 12
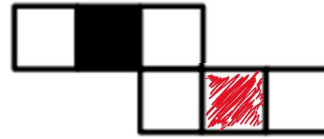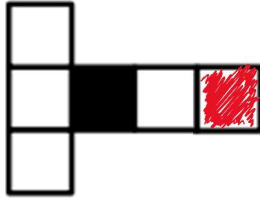
8207 – 7 = 8200,

8200 – 5 = 8195

$$\begin{array}{r} 8207 \\ - \quad 12 \\ \hline 8195 \end{array}$$

Answer: ......8195......

7) Both of these nets fold to make a cube.

Shade the square that will be opposite the black square when the net is folded into a cube.

Each face in a cube has 4 adjacent and 1 opposite face, thus the opposite faces don't share any edges. Try folding the cube net mentally and shade the square opposite to the black square.

8) Work out the value of:

a. $3 \times 7 + 4$

Multiplication before Addition

$3 \times 7 = 21$

$21 + 4 = 25$

Use BIDMAS for these questions

Answer: ......25......

b. $12 \div 6 \div 2$

Both are Division

$12 \div 6 = 2$

$2 \div 2 = 1$

Answer: ......1......

c. $15 - 4 \times 2$

Multiplication before Subtraction

$-4 \times 2 = -8$

$15 - 8 = 7$

Answer: ......7......

9) Shade in $\frac{3}{5}$ of this shape
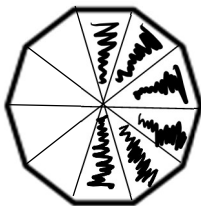
$$\frac{3}{5} \overset{\times 2}{\underset{\times 2}{=}} \frac{6}{10}$$

This decagon (10-sided polygon) can be divided into 10 equal parts. Thus, we change the fractions's denominator to shade accordingly!

10) Write down the mathematical name for each of these 2D shapes:

| 2 pairs of equal and parallel sides | 5-sided polygon with equal sides | Only 1 pair of parallel (not equal) sides |

Parallelogram

Regular Pentagon

Trapezium

Answers: ....

11) Here is a table showing how many minutes four children took to get to school last week

	Maxine	Ava	Ellie	Sara
Monday	23	14	12	19
Tuesday	24	17	15	25
Wednesday	31	11	18	41
Thursday	26	16	12	22
Friday	19	16	16	23

a. Who took over 40 minutes to get to school?

Answer: .... Sara

b. Which person has the shortest journey to school on any day?

Answer: .... Ava

c. On Thursday, what is the range of the times?

Range = Highest value – Lowest value

26 – 12 = 14

Answer: 14

a
numbers from 12 to less than 12.5 → (round to 12)

numbers from 12.5 up to 13 → (round to 13)

b
numbers from 12 to less than 12.05 → (round to 12)

numbers from 12.05 up to 12.1 → (round to 12.1)

12) Round 12.05 to:

a. The nearest whole number

12.05

12   12.5   13

b. To 1 decimal place

Answer: 12

Answer: 12.1

12   12.05   12.1

13) Here is a bar chart.

Ice Cream bought by Mr Gauss

Money Spent (£)

20

10

0

Chocolate   Strawberry   Vanilla   Mint

Flavour
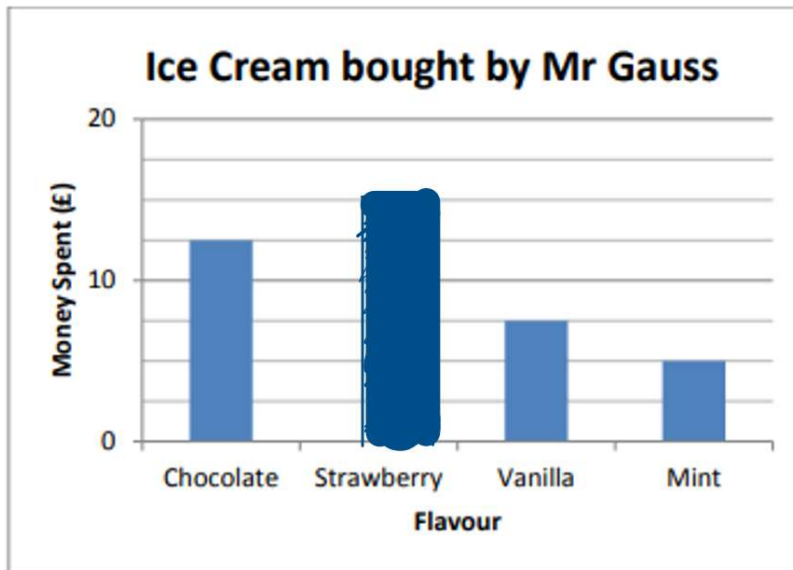
Let's find out the value of each interval. As we can see there are 4 intervals between £0 and £10, which means each intervals represents £10 ÷ 4 = £2.50

The bar for strawberry is missing! Mr Gauss spent £15 on Strawberry ice cream.

a. Draw a bar to show how much Mr Gauss spent on Strawberry ice cream.

£15 = £10 + £5 (2 lines above £10). This can also be found by going halfway between 10 and 20

b. How much did Mr Gauss spend on Vanilla Ice Cream?

The Vanilla Ice Cream bar has a height of 3 intervals
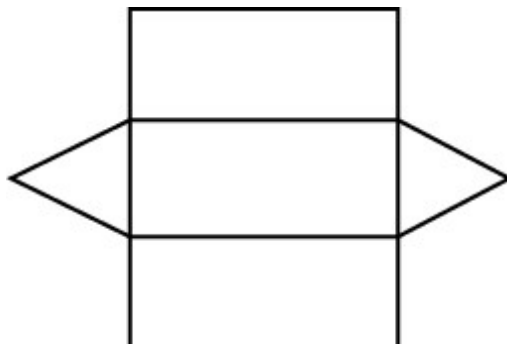
thus, its value will be £2.50 X 3 = £7.50

Answer: ....£ 7.50.......

14) Fill in the next two values in this sequence:

$+0.75$ $+0.75$ $+0.75$ $+0.75$

1.75 2.5 3.25 4 $4.75 = 4\frac{3}{4}$

$1\frac{3}{4},$ $2\frac{1}{2},$ $3\frac{1}{4},$ _____ , _____ , ...

$0.75 = \frac{3}{4}$

This is an ascending (increasing) sequence. To find the next terms we can find the difference between the terms and keep adding to get the next two values
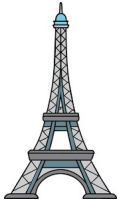
15) Draw a net of a triangular prism

The two triangles on the sides are the cross sections of the prism. And the three rectangles form the base (middle) and the roofs. The rectangles can be replaced by equal squares too!

16) How many edges does a cube have?
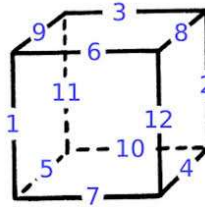
Answer: ....12........

17) Which of the following is the best estimate for the length of a bus?
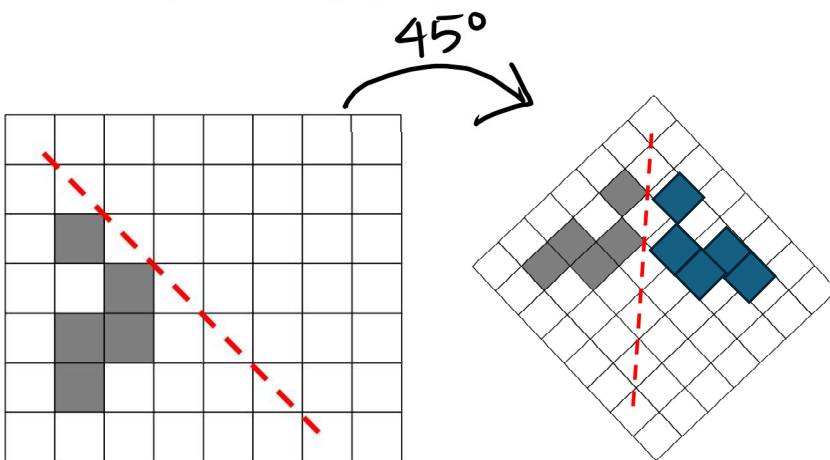
0.2km　　　2m　　　20cm　　　20 000mm

With the examples shown beside the lengths, 20,000 mm = 20 m is a much more reasonable length for a bus

$= 2000\ cm$
$= 20m$

Answer: ....20,000mm........

18) Reflect the grey shape in the dashed mirror line.

45°

Try looking at the shape in such a way that the red dotted line is vertical, this way it's easier to judge the distance between the red line and the squares. One way to make sure it has been correctly replicated, is to count the number of squares on each side!

19) The temperature in Inverness is 12 degrees lower than the temperature in London.
The temperature in London is 5 degrees.

What is the temperature in Inverness?

−12

-7 -6 -5 -4 -3 -2 -1 0 1 2 3 4 5
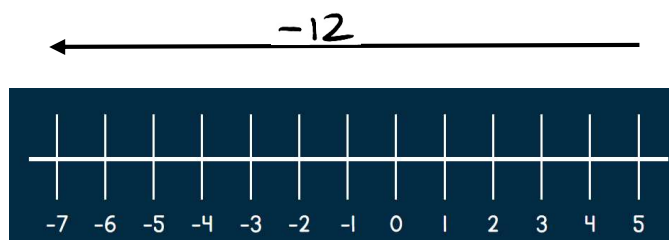
Temperatures can be negatives so don't worry on getting -7 degrees as the answer :)

For a better understanding here is a number line:
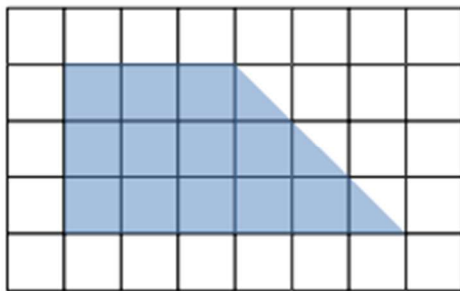
-7 degrees
Answer: ....

$5 - 12 = -7$

20) Find the areas of the following shapes:

Area of the square: Area of half of the square:

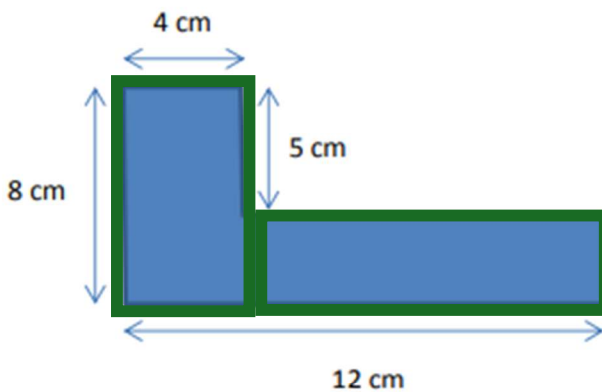3 X 3 = 9   0.5 X 9 = 4.5

$= 9 + 4.5$

$= 13.5$

1 square = 1 cm²
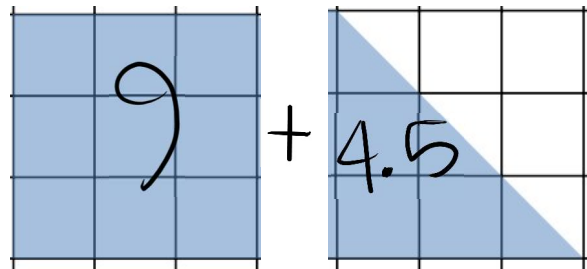
> You can also find the area of this compound shape (made up of two or more shapes) by counting the number of squares = 12 + 0.5 + 0.5 + 0.5 = 13.5

13.5

Answer: ....13.5...........cm²

> Area of rectangle = length X width

4 cm

5 cm

8 cm

12 cm

Not drawn to scale

4

8 | Area 32 | 8-5 =3 | A = 8×3=24 | 3

8

12 − 4 = 8

32 + 24 = 56

56

Answer: ....56...........cm²

21) Max has more than 4 apples but fewer than 7 apples. Alex has more than 5 apples and fewer than eight apples.

How many apples do Max and Alex have *altogether*? Circle all the possible values

4   5   6   7   8   9   10   ⑪   ⑫   ⑬   14   15

Here is a 2-way table where we can fine the sum of the number of apples accordingly:

	Max (5)	Max (6)
Alex (6)	11	12
Alex (7)	12	13

11 or 12 or 13

Answer: ....

22) Suki saves £12 in January, £18 in February and £5 in March.
What is her mean (average) monthly saving?

2 dp.

$$11.66... \approx 11.67$$
$$3 \overline{)3\,^05\,^250\,^20...}$$

$$Average = \frac{Total\ of\ all\ values}{Number\ of\ values}$$

$$\frac{12+18+5}{3} = \frac{35}{3}$$

$$= £11 \cdot 67$$

Answer: ....

23) What is $\frac{1}{2}$ of $\frac{4}{5}$ of 35?

You can use 'of' as multiplication

$$\frac{1}{2} \times \frac{4^2}{5} \times 35^7 = 2 \times 7$$
$$= 14$$

We can cancel common factors from the numerator and denominator

Answer: _____14_____

24) Put the following numbers in order from smallest to largest:

$\frac{3}{5}$ 0.58 $\frac{5}{8}$ 62%   0.508

$= 0.6$ $= 0.625$ $= 0.62$
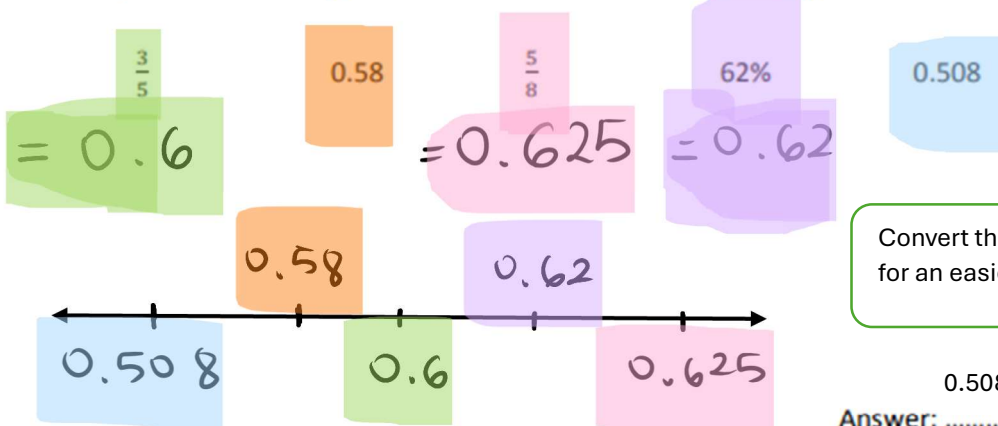
0.58   0.62

0.508   0.6   0.625

Convert the numbers into decimals for an easier comparison!

0.508, 0.58, 0.6, 0.62, 0.625

Answer: ....

25) You are told that 82 × 107 = 8774

Use this to work out the value of the following:

> We can perform the same operation on both sides of the equations. That way once we reach the same terms as the questions on one side of the equation, the other side will have its answer!

a. 8200 × 107

$82 \times 107 = 8774 \times 100$

$\times 100$

Answer: 877400

b. 8774 ÷ 107

$82 \times 107 = 8774 \div 107$

$\div 107 = 82$

Answer: 82

c. 8774 ÷ 41

$82 \times 107 = 8774 \div 41$

$\div 41$

$= 107 \times 2$

$= 214$

Answer: 214

d. A bus can seat 82 people.
8770 people travel to a football match by bus.
How many buses are needed?

$$106 \ r \ 78$$
$$82 \overline{\smash)8770}$$

Answer: 107

> Since there is a remainder of 78, this means 106 buses are not enough and we need one extra bus for the 78 people left. Thus, the answer will be 106 + 1 = 107