BENENDEN

# Lower School Entrance 2019

# MATHEMATICS

## 12+

## 1 Hour

| | |
|---|---|
| **Name:** | ……..…….…… |
| **School:** | …….…….…… |
| **Date:** | ……..…….…… |

**Equipment required: pen, pencil, ruler, eraser.**

**Instructions to Candidates:**

1 Attempt all questions. Do not worry if you don't manage to do them all.
2 Calculators may NOT be used.
3 Show ALL working.
4 Check your answers for accuracy.
5 Total points for test: 100.

1. Work out:

a) 23 x 14 b) 3.405 + 12.056

……. ……

c) 46156 – 879 d) 225 ÷ 4

……. ……

[8]

2. Write the following numbers in order of size:

3.5 0.335 3.35 0.3 0.0335 0.0385

……

[1]

3. Work out:

a) 5 – -2 ……

d) -25 ÷ -5 ……

e) $3 + 5 \times 2^2$ ……

f) $20 – (3^2 + 6)$ ……

[6]

4.

a) Write down a prime number that is between 20 and 30 ……..

b) Write down a multiple of both 8 and 12 that is less than 50

…….

[2]

5. Here are some numbers in a box.

| 2 | 9 | 18 | 22 | 27 | 31 |
|---|---|---|---|---|---|

From the numbers in the box, write down

(c) (i) a factor of 6

.....

(ii) a square number

.....

(iii) a cube number

.....

[3]

6.

a) Write down all the factors of 40

……..

b) Write down all the factors of 24

……..

c) What is the highest common factor of 40 and 24?

…….

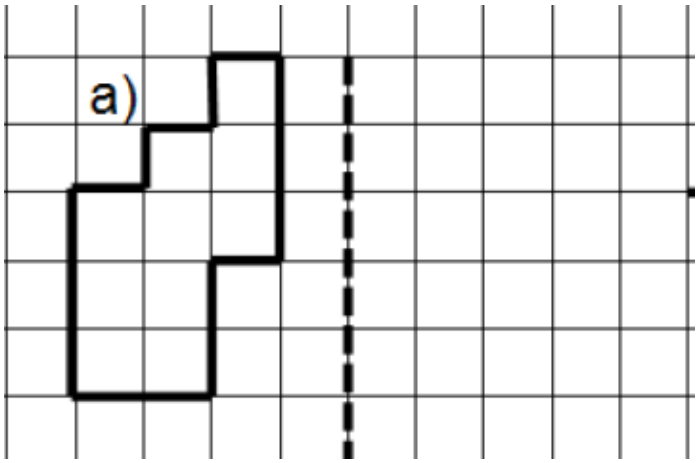
d) Write 360 as a product of its prime factors.
Show your working clearly

……

[5]

7.

Reflect the following shape in the mirror line given




[2]

8. Here are six numbers.

7 4 2 6 6 5

a) Find the mean

……

b) Find the median

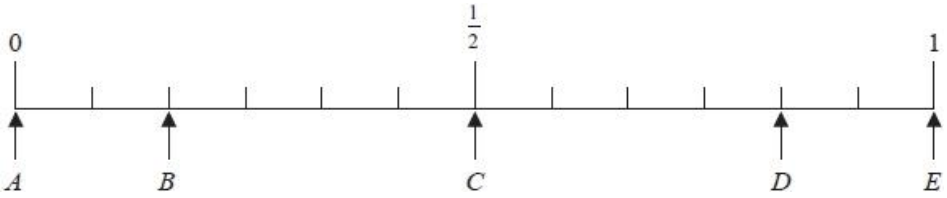
……..

c) Find the range

……..

[3]

9. Here is a probability scale.




Jasmin has a bag of 12 sweets.
There are 6 red sweets, 2 yellow sweets and 4 green sweets.

Jasmin takes at random a sweet from the bag.

Write down the letter of the arrow that points to the probability that

(i) Jasmin takes a red sweet,

.....

(ii) Jasmin takes a sweet that is **not** yellow,

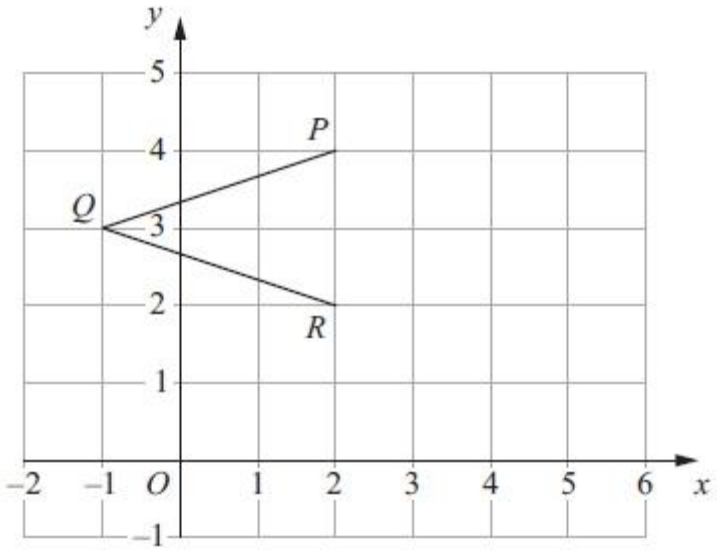
.....

(iii) Jasmin takes a purple sweet.

.....

[3]

10. The diagram shows three points *P*, *Q* and *R* on a 1 cm grid.




(a) Write down the coordinates of *P*. (..... , .....)

(b) On the grid, mark the point (5,3) Label the point S

(c) Join the point S to the points P and R. What shape have you drawn?

.....[3]

11. Write the following fraction in its simplest form

$$\frac{10}{14} =$$

……..

[1]

12. Write the following as an improper fraction

$$2\frac{3}{4} =$$ .....

[1]

13. Calculate

a) $\frac{5}{6} + \frac{3}{5}$

……

b) $2\frac{3}{4} - 1\frac{2}{5}$

……

c) $\frac{1}{6} \times \frac{4}{5}$

……

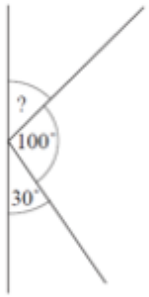
d) $\frac{4}{5} \div \frac{3}{10}$

……

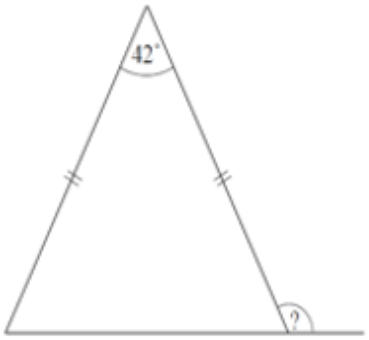
[8]

14. Find the missing angles

a)

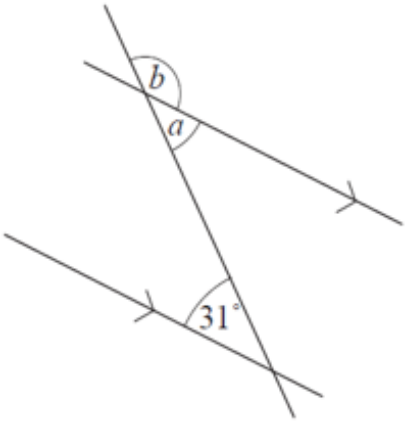



b)




..... ..... [2]

15. Find the size of angles a and b. Give reasons for your answers




Angle a = .....

Reason .....

.....

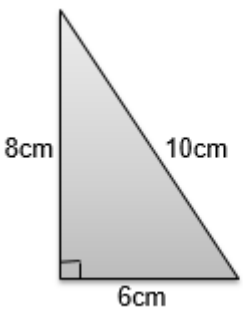
Angle b = .....

Reason .....

..... [4]

16. Find the area of the triangle

a)




.....

[2]

17. Simplify the following

a) 4a – 3b + 6a – 2b

……..

b) 5 – 2a + 7 – 4a

……..

c) a x a x a x a

……..

d) 3a x 5a

……..

[4]

18. Multiply out the brackets (simplify where necessary)

a) 3(a + 7b)

……..

b) 6(a + 2) + 3(a – 5)

……..

[3]

19. Solve the following equations

a) $3x - 1 = 14$

……..

[2]

b) $4(2x - 5) = 20$

……..

[3]

c) $3x + 1 = x + 7$

……..

[3]

20. If a = 3 b = 5 and c = -2

Find the value of:

a) a + b – c

…….

b) 2a + 5b

……..

c) 3ab

…….

d) $4c^2$

……..

[4]

21.

a) Simplify the following ratios:

i) 16:20

……

ii) 45:36:18

……

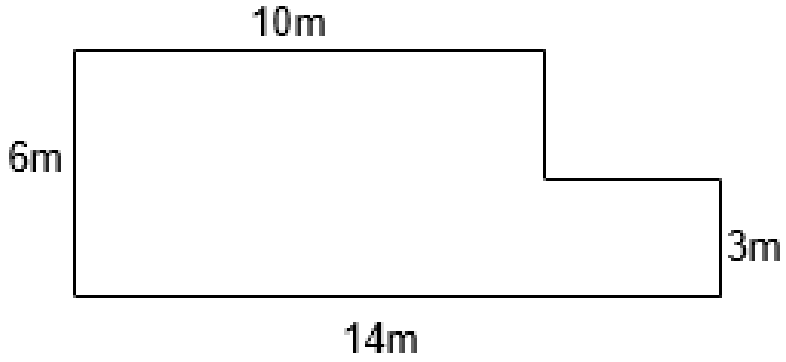
b) Lisa and Max share £210 in the ratio 3 : 4

How much do they each get?

……

[4]

22. Find the area and perimeter of the following shape




Area = ……$cm^2$ (2)

Perimeter = ……cm (2)

23. When a barrel is 30% empty it contains 30 litres more than when it is 30% full.
How many litres does it contain when it is full?

……. (2)

24. a) Write $\frac{3}{5}$ as a decimal.

[1]

b) Write $\frac{3}{5}$ as a percentage.

[1]

c) Mathsville School has 875 students.

$\frac{3}{5}$ of the students are girls.

(i) Work out $\frac{3}{5}$ of 875

(ii) Work out the fraction of the students who are boys.

(iii) 8% of the students were born in May.
Work out 8% of 875

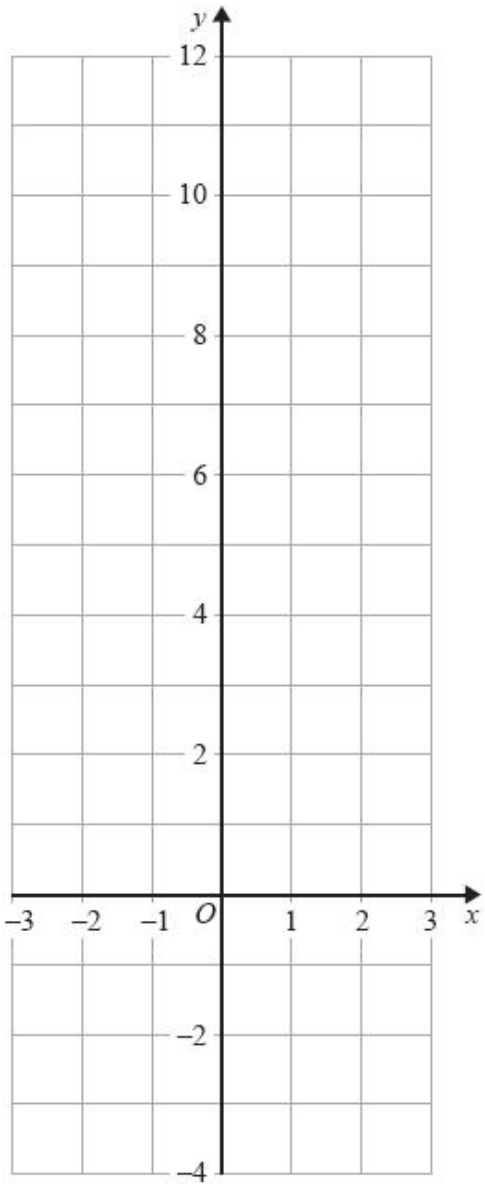
[4]

25. a) Complete the table of values for y= 2x + 4

| x | -2 | -1 | 0 | 1 | 2 |
|---|---|---|---|---|---|
| y | | | | | |

[2]

b) On the grid, use your table of values to draw the graph of y= 2x+4




[2]

26.

Which provides the larger share: two bars of chocolate shared fairly between three people, or five bars shared between seven people?

You must show working to support your answer

…… [3]

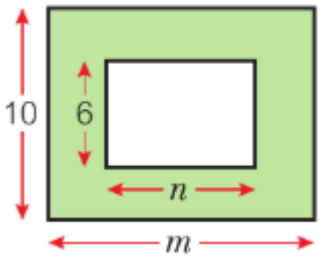
27.

Lucy's bucket holds 5 litres of water. She uses *n* buckets full of water to fill a paddling pool. After 10 litres of water leaked out the pool contained 80 litres. How many buckets did Lucy need to fill the pool?

…… [2]

28.

The following shape is made by cutting a rectangle from a larger rectangle. Use algebra to write an expression for the area of the shaded shape.




…… [2]

END OF TEST

TOTAL MARKS = 100

IF YOU HAVE TIME, TRY THE FOLLOWING:

1. The average height of two boys is 1.65m.
   The difference in their heights is 0.02m.
   How tall is the shorter boy?

_____

2. Each of the following is wrong. Every single digit is either too big by one or too small by one. Can you sort them out?

a)
```
  43
+ 57
--------
 207
--------
```

b)
```
  7668
+ 2692
-----------
  9027
-----------
```

c)
```
  1663
x    3
----------
 21379
----------
```