BENENDEN

Lower School Entrance 2020

MATHEMATICS

13+ Scholarship

1 Hour

Name:	……..……..……
School:	……..……..……
Date:	……..……..……

Equipment required: pen, pencil, ruler, eraser.

Instructions to Candidates:

1 Attempt all the 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 the test: 100

1. Becky and Jo deliver advertising leaflets for a firm. They are given leaflets in the ratio 7 : 5 and are paid accordingly.

   a) One week, Jo earns £35. How much does Becky earn?

   …… (1)

   b) The next week, Becky earns £126. How much does Jo earn?

   …… (1)

   c) The third week, their total earnings are £312. How much does each earn?

   ……

   …… (3)

2. Maria asked her class which flavour of ice cream each liked best. The responses were:

Vanilla:	12
Strawberry	6
Chocolate	5
Other	7

   Maria decided to represent these results in a pie chart.
   At the centre of the "pie" circle, what angle would she need to draw for each sector of the pie chart?

   Vanilla: …….

   Strawberry …….

   Chocolate …….

   Other ……. (4)

3. The mean of six numbers is 5
   The numbers are: 2, 3, 7, 8, 6, ?

   What is the missing number?

…… (2)

4. Calculate:

   a) $6\frac{4}{7} - 2\frac{1}{3}$

…….. (4)

   b) $4 \div \frac{7}{9}$

…….. (3)

5. Solve the equations:

   a) $4(p - 13) = 37 - 6p$

…….. (3)

   b) $\frac{9q - 11}{4} = 2q$

…… (3)

6. Find the value of:

a) $8^2 - \sqrt{25}$

…….. (1)

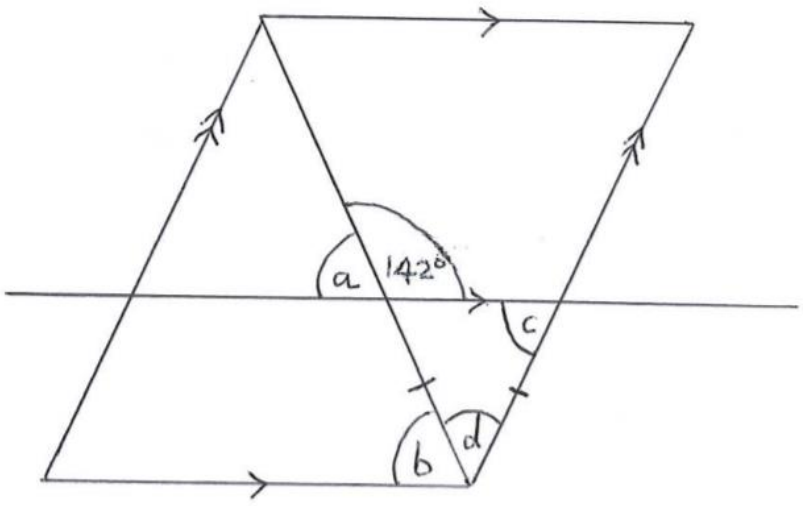
b) The perimeter of a square whose area is $121cm^2$.

…… (2)

c) The square root of 90, to the nearest whole number.

…… (2)

7. Find the angles *a, b, c* and *d* , in the diagram below, which is **not drawn to scale** :



a = ……, *b* = ……, *c* = ……., *d* = …… (4)

8. Add signs (+, -, x, ÷) and brackets to the following statements, to make them true:

   a) 3 4 5 = - 17 (2)

   b) 9 2 7 4^2 = 2 (2)

9. Expand and simplify:

   a) *a(pq - a)*

   …… (2)

   b) *8(6s - 5t) - (2s + t)*

   …… (3)

   c) *(9 - 2v)(7v + 5)*

   …… (3)

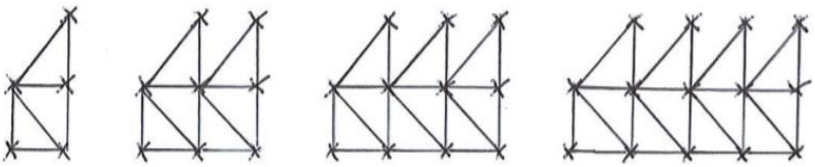
10. a) List all the factors of 60

   …….. (2)

   b) Find the Highest Common Factor of 96 and 60

   ……. (2)

11. Look at the following patterns:



a) Draw the next pattern in the sequence:

(2)

b) How many triangles are there in the 10^{th} pattern?

…… (2)

c) How many short lines connecting two crosses will there be in the 10^{th} pattern?

…….. (2)

d) How many crosses will there be in the 10^{th} pattern?

……. (2)

12. If $x = 1.2$, $y = 7$ and $z = -4$, find the value of:

a) $xy - z$

…….. (3)

b) $z^2 + 6x$

…… (3)

13. a) 48% of the members of a swimming club are male.
What fraction of the club are female? Write this fraction in its lowest terms.

…….. (2)

b) Bella scored 56 out of 80 in a Maths test. What was her score as a percentage?

…….. (2)

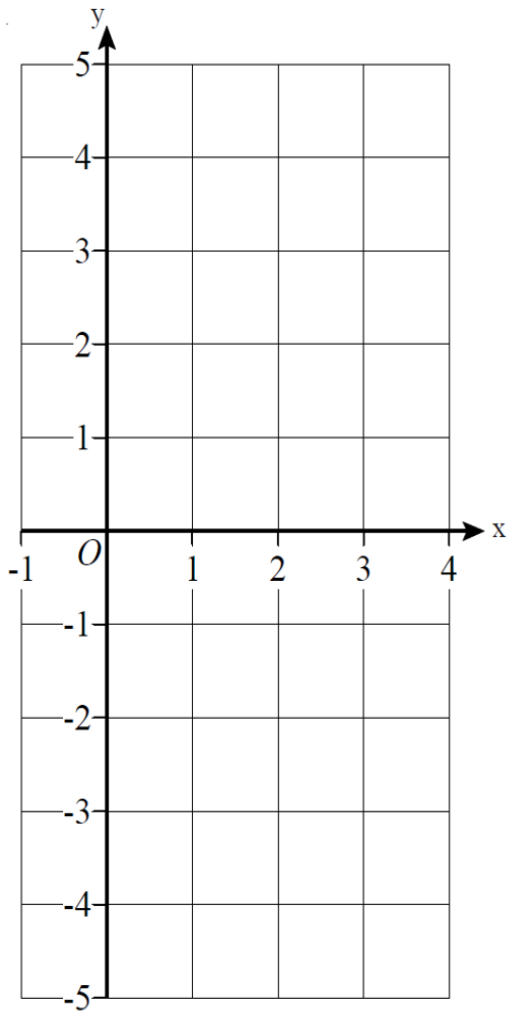
c) A bookshop owner took a box of 24 books from the delivery van to the storeroom of his shop, and on the way he tripped, dropping the box. 6 books fell out and were damaged. He had to sell these 6 at a 15% loss.
He had been intending to sell the whole box of 24 for a total of £288.
How much did he lose?

……. (4)

14. The equation $y = x - 2$ can be written in different ways. Put a tick next to the correct ones:

$y - x = 2$	……...
$x = 2 + y$	……...
$y + 2 = -x$	……...
$x = y - 2$	……...
$x - y - 2 = 0$	……...

On the grid below, draw the line $y = x - 2$



(5)

15. The table shows the times that Hannah was at work during a particular week.

	Monday	Tuesday	Wednesday	Thursday	Friday
Start	09 00	08 55	08 15	09 10	09 15
Finish	17 05	16 10	16 00	17 00	16 30

Which day did Hannah work for the longest time?

…….. (3)

16 Solve the simultaneous equations:

$3x + 2y = 5$

$7x + 3y = 5$

…….

……. (5)

17. In 2005, Sarah was three times as old as her daughter Louise. In 2000 their ages totalled 50.
How old was Louise in 2005?

……. (4)

18. In a school there were 100 children in Year 8.
Lori did a survey to find out how many were left-handed and how many were right-handed. She drew up the following table:

	Left-handed	Right-handed
Boys	9	40
Girls	7	44

There was a Year 8 Activity Event in the school hall and a teacher randomly picked a child to do a task.

a) What was the probability that the child was a girl?

……. (2)

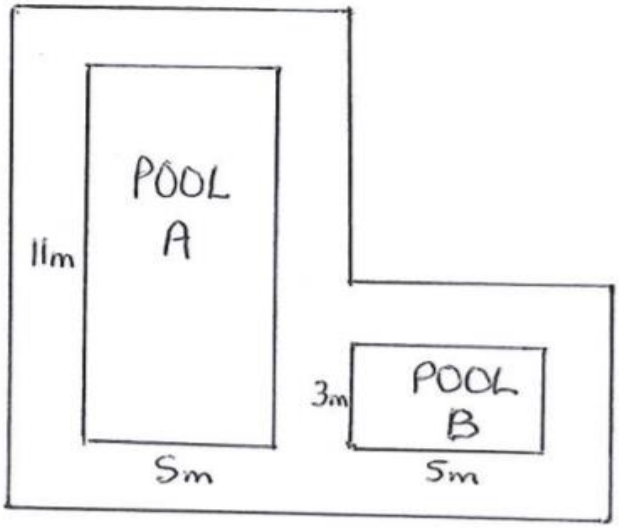
b) What was the probability that the child was a left-handed boy?

……. (2)

c) What was the probability that the child was not a right-handed girl?

……. (2)

19. Howgood Primary School has two swimming pools. Pool A was for the older children. Pool B was for the smaller ones. The pool area is illustrated below **(not drawn to scale).**



A cement path surrounds both pools, as shown in the diagram. The path is 2m wide at all points.

a) Calculate the outer perimeter of the whole pool complex.

…….. (3)

b) Calculate the total area of the path, all around the pool.

…….. (3)

END OF QUESTIONS

If you have time, try the puzzles on the next page

1. Using the numbers 1, 2, 3 and 4 only, and the operations (+ - x ÷) and brackets, make as many totals between 1 and 20 as you can

eg 1 + 2 + 3 - 4 = 2

2. From the row of numbers below, which number is 3 to the right of the number 4 to the left of the number 2 to the left of the number immediately on the right of the number 2 towards the middle of the row from the number 3 to the left of the number 2 to the right of the number **10**?

1 2 3 4 5 6 7 8 9 10 11 12