BEYOND MATHS

PRIMARY SCHOOL CHALLENGE 2022

LEVEL 2 CHALLENGE
GRADE 6 AND 7 ROUND TWO

INSTRUCTIONS

1. The time allocated for this paper is $1\frac{1}{2}$ hours.
All participants must remain for the full allocated time.
Under no circumstances may extra time be given.

2. This paper consists of two sections.
Section A consists of 10 multiple choice questions.
Section B consists of 5 questions where working out must be shown.

3. Question 1 – 10 are worth 2 marks each.
Question 11 – 15 are worth 4 marks each. Part marks may be awarded.

4. Negative marking will not be applied.

5. Calculators (and other calculating devices) and geometry instruments are not allowed.

6. Figures are not necessarily drawn to scale.

7. Answer all questions on the answer sheet provided.

8. Circle the letter you have chosen as your answer in pen for Section A (Questions 1 – 10). Should you wish to change an answer, put a cross over the letter and then circle your new chosen letter.

9. For Section B (Questions 11 – 15), full working must be shown in the space provided. Your final answer must be written in the allocated space.

10. Paper may be used for rough working.

SECTION A

1. Which number is exactly one quarter of the way between 1022 and 2022? The number is closer to 1022.

A. 1200 B. 1772 C. 1202 D. 1272 E. 1252

2. Which fraction lies between $\frac{2}{3}$ and $\frac{6}{7}$?

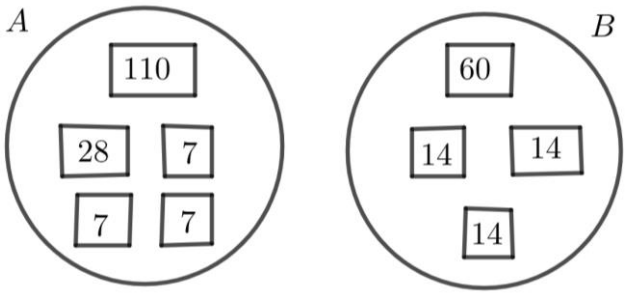
A. $\frac{25}{42}$ B. $\frac{55}{63}$ C. $\frac{16}{21}$ D. $\frac{13}{14}$ E. $\frac{10}{15}$

3. What is the value of:

$$\frac{1}{3} \times \left(2022 \times \frac{1}{2} + 2022 \div \frac{1}{2} - 2022\right)$$

A. 0 B. 1111 C. 3033 D. 2022 E. 1011

4. In the diagram below, circle A contains five boxes and circle B contains four boxes. The weight in kilograms of each box is shown.



Some of the boxes are moved from circle *A* to circle *B*, and some of the boxes are moved from circle *B* to circle *A*. Once a box is moved, it is not moved again.

After the moves, the total weight of the boxes in circle A is 71 kilograms less than it was in the diagram, while the total weight of the boxes in circle B is 71 kilograms more than it was in the diagram.

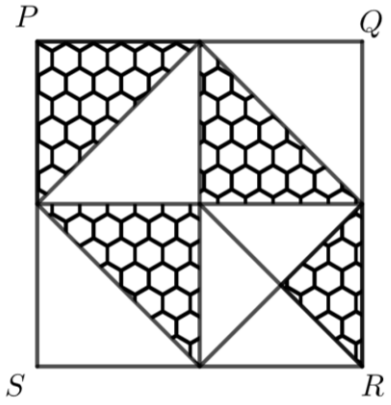
What is the smallest possible number of boxes moved?

A. 5 B. 3 C. 7 D. 4 E. 6

5. A number of pupils met on a field. Some of them brought a single dog with them. In total there were 100 legs and 70 eyes.
How many pupils did not bring a dog?

A. 20 B. 10 C. 8 D. 15 E. 5

6. In the figure, square $PQRS$ is divided into four smaller squares, and these squares are divided into triangles as shown.



What fraction of $PQRS$ is shaded?

A. $\frac{7}{16}$ B. $\frac{4}{7}$ C. $\frac{5}{8}$ D. $\frac{13}{32}$ E. $\frac{3}{8}$

7. m and n are integers such that:

$$m \times n = 19$$

How many different values are possible for m ?

A. 2 B. 3 C. 4 D. 5 E. 6

8. When a water container is 20% empty, it holds 51 litres more than when it is 20% full.
How many litres of water does the container hold when it is full?

A. 102 B. 80 C. 95 D. 78 E. 85

9. In the multiplication below, $1MATHS$ is a 6-digit number. The letters $M, A, T, H,$ and S stand for different numbers $0 - 9$.

$$1MATHS \times 3 = MATHS1$$

What is the value of the sum $M + A + T + H + S$?

A. 26 B. 31 C. 22 D. 28 E. 23

10. In the following equations, m , n , p , q are all greater than 5.

$$\frac{1}{m-4} = \frac{1}{n+4} = \frac{1}{p+3} = \frac{1}{q-5}$$

Which of the following is always true?

A. $m > q > p > n$ B. $p > n \ and \ n > m$ C. $p < n < m < q$
D. $n < p < m < q$ E. $m < p < n < q$

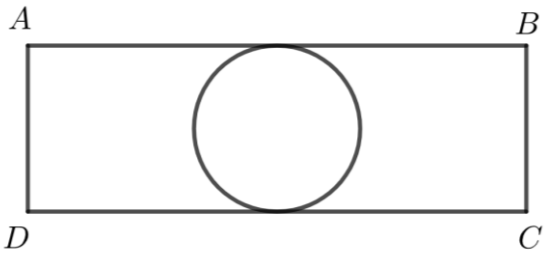
SECTION B

NB : Show all working and write your final answer in the allocated space.
Part marks may be awarded.

11. $\frac{2022}{17} = a + \frac{1}{b+\frac{1}{c}}$ where a, b, c are natural numbers.

What is the value of $a + b + c$? (Show all working)

12. In the figure, a circle lies symmetrically within rectangle $ABCD$. Both the longer sides of the rectangle are tangent to the circle as shown. The diagonal of the rectangle is 10 and the radius of the circle is 3.



A pupil is blindfolded and randomly sticks a pin into the figure $ABCD$. The probability that the pin does NOT land within the circle is given by $P = \frac{a}{b}$, where a and b have no common divisors other than 1.

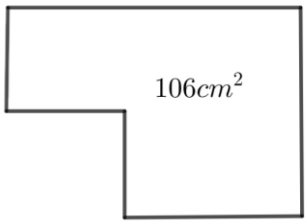
What is the value of $a + b$? Use $\pi = \frac{22}{7}$. (Show all working)

13. A non-ordered list of natural numbers represented by $A - H$ is shown below. (The list is not in any particular order) The sum of the values of every four consecutive letters is 32. $B + G = 13$.

$$A\ ;\ B\ ;\ C\ ;\ D\ ;\ E\ ;\ F\ ;\ G\ ;\ H$$

What is the largest possible value of A ? (Show all working)

14. The figure in the sketch (not shown to scale) is made up of two different size, non-overlapping squares, each with whole number sides. The total area of the figure is $106cm^2$.



What is the perimeter of the figure in cm ? (Show all working)

15. In the sum of three 3-digit numbers below, each letter stands for a different number $1-9$. $1CCB$ is a 4-digit number.

$$\begin{array}{r} A\ B\ C \\ B\ C\ A \\ +\ C\ A\ B \\ \hline 1\ C\ C\ B \end{array}$$

If $A < B < C$, how many different values are possible for the answer $1CCB$?

(Show all working)

********** END **********