

PRIMARY SCHOOL  
CHALLENGE 2022

**LEVEL 1 CHALLENGE**  
**GRADE 4 AND 5 ROUND ONE**

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**INSTRUCTIONS**

1. The time allocated for this paper is 1 hour.

Under no circumstances may extra time be given.

2. This paper consists of 20 multiple choice questions.

Each question only has one correct answer.

3. Questions 1-15 are each worth 1 mark. Questions 16-20 are each worth 2 marks.

4. Negative marking will not be applied.

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

6. Figures are not drawn to scale.

7. Answer all questions on the answer sheet provided.

8. Circle the letter you have chosen as your answer in pen. Should you wish to change an answer, put a cross over the letter and then circle your new chosen letter.

9. Paper may be used for rough working.

1. What number must be added to 999 to get 2022?  
 (A) 923      (B) 1123      (C) 1023      (D) 1033      (E) 933
  
2. How many 4-digit numbers bigger than 2000 can be formed using each of the digits of 2022 only once? (There are three 2's in 2022, so 2 may be used three times)  
 (A) 4              (B) 3              (C) 2              (D) 5              (E) 6
  
3. I am a 6-digit number divisible by 2 and by 5. My first two digits are divisible by four. My middle two digits are divisible by three. What number am I?  
 (A) 201225      (B) 621230      (C) 402820      (D) 721520      (E) 801845
  
4. The following pattern continues in the same manner:  
 $\oplus$  ;  $\triangle$  ; # ;  $\odot$  ; @ ;  $\oplus$  ;  $\triangle$  ; # ; .....  
 Which of the following will be in position 2022 in the pattern?  
 (A)  $\triangle$       (B) @      (C)  $\oplus$       (D) #      (E)  $\odot$
  
5. What is the value of:  $2 + 0 + 2 + 2 + 20 + 202 + 2022$  ?  
 (A) 2240      (B) 2248      (C) 2246      (D) 2242      (E) 2250
  
6. A box contains 16 red balls, 18 green balls and 13 blue balls, each of identical shape and size. Blindfolded, you remove balls one-by-one from the box.  
  
 What is the smallest number of balls which must be removed such that you can be sure that you have at least three different coloured balls?  
 (A) 4              (B) 29              (C) 35              (D) 16              (E) 18

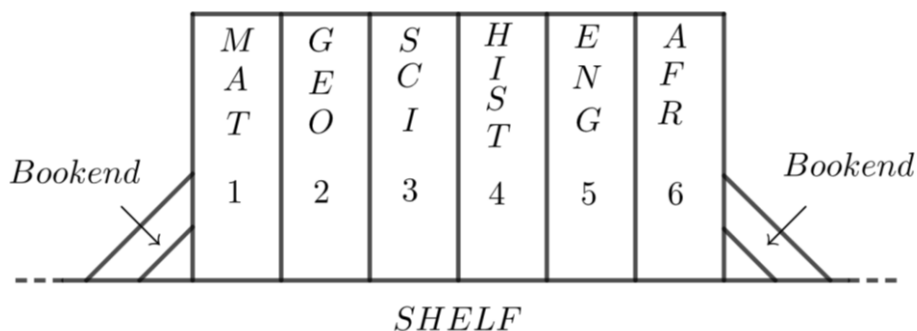
7. A number of students are in a lecture hall.  $\frac{1}{4}$  of them have only a blue pen,  $\frac{1}{5}$  of them have only a red pen, and  $\frac{1}{3}$  of them have only a pencil.

What is the smallest number of students in the lecture hall?

- (A) 40      (B) 60      (C) 90      (D) 80      (E) 50
8. If  $m = 3$  and  $n = 5$ , what is the value of:
- $$2 \times m \times n - (m + n) + (n - m) ?$$
- (A) 27      (B) 22      (C) 23      (D) 30      (E) 24
9. The combined age of five friends is 100. What was their combined age on the same day 12 years ago?

- (A) 60      (B) 42      (C) 50      (D) 40      (E) 38

10. In the sketch, paperback books 1 – 6 stand on a shelf in the usual manner. All the books are 45mm thick. They are held vertically upright and touching one another by bookends.



An insect known as a bookworm is living in Book 1. The insect eats its way through the books in a straight line perpendicular to the front and back book covers. If the insect eats in a straight line from the front cover of Book 1 to the back cover of Book 6, what distance in *mm* did the insect eat its way through?

- (A) 225      (B) 190      (C) 270      (D) 180      (E) 135

11.  $\frac{a}{b} = 7$  where  $a$  and  $b$  are 2-digit natural numbers.  
 What is the biggest sum  $(a + b)$ ?
- (A) 112      (B) 104      (C) 128      (D) 120      (E) 108

12. What is the value of  $\frac{3}{2} \times \frac{4}{3} \times \frac{5}{4} \times \frac{6}{5} \times \dots$  if this pattern continues for 2022 multiplications?
- (A) 1012      (B) 2022,5      (C) 2022      (D) 1012,5      (E) 2024

13. In the equations below, what is the value of  $\Delta$  ?

$$\boxplus + \boxplus = 8$$

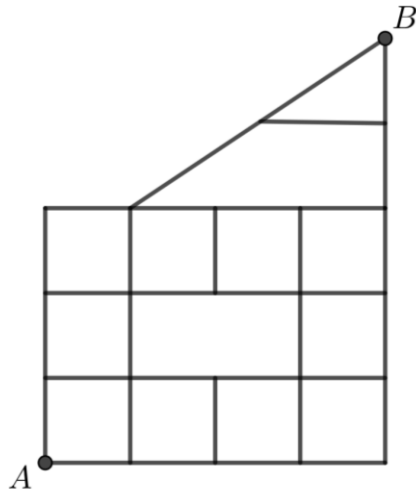
$$\oplus - \boxplus = 6$$

$$\Delta + \oplus = 11$$

- (A) 1      (B) 2      (C) 3      (D) 4      (E) 5
14. Errol is writing a test. He answers 40 questions in two hours. If he always worked at exactly the same rate, how many questions did he answer in 75 minutes?
- (A) 23      (B) 30      (C) 27      (D) 22      (E) 25

15. In the diagram, Sarah is standing at  $A$  and wants to walk to  $B$ . She is only allowed to move to the right ( $\rightarrow$ ), up ( $\uparrow$ ), and diagonally up ( $\nearrow$ ).

How many different paths can she use in walking from  $A$  to  $B$ ?



- (A) 36      (B) 28      (C) 32      (D) 30      (E) 34
16. Brian is inviting 79 friends to his party. He has 12 tables which can seat 2 people each, and 5 tables which can seat 4 people each.

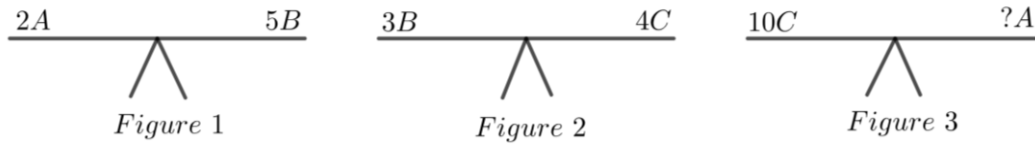
How many more tables which can seat 4 people each does Brian need if everyone at the party can be exactly seated at once? (No spare tables or chairs)

- (A) 6      (B) 9      (C) 8      (D) 7      (E) 5
17. What is the value of:

$$2022 \times 2 + 2022 \div 2 + 2022 + 2 + 2022 - 2 ?$$

- (A) 8088      (B) 9199      (C) 8888      (D) 9024      (E) 9099

18. Objects  $A$ ,  $B$ , and  $C$  have different weights. Different numbers of these weights are shown on the see-saws below. Each figure shows a balanced see-saw, that is, there is exactly the same amount of weight on each end.

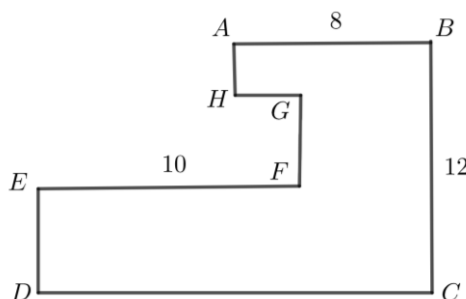


How many objects of weight  $A$  are in *Figure 3*? (What is the numerical value of the “?” in front of the  $A$  in *Figure 3*?)

- (A) 4            (B) 3            (C) 6            (D) 2            (E) 5
19. Mpilo begins counting down by 7's from 1400 (1400; 1393; 1386; .....), while Phumla begins counting up by 8's from 500 (500; 508; 516; .....). If they both start counting at exactly the same time, and both count at exactly the same rate, which number will they both say at exactly the same time?

- (A) 980            (B) 1000            (C) 910            (D) 870            (E) 1010

20. In the figure  $ABCDEFGH$  below, all sides intersect at right angles.  $AB = 8$ .  
 $BC = 12$ .     $EF = 10$ .



What is the perimeter of figure  $ABCDEFGH$ ? (Perimeter means the sum of all the side lengths around the outside of the figure)

- (A) 70            (B) 48            (C) 60            (D) 52            (E) 50