

PRIMARY SCHOOL
CHALLENGE 2023

LEVEL 2 CHALLENGE
GRADE 6 AND 7 ROUND ONE

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 is the value of: $(2 + 0 + 2 + 3) \times (2 - 0 - 2 - 3) + 2023$?
 (A) 1974 (B) 2044 (C) 2023 (D) 2002 (E) 2027

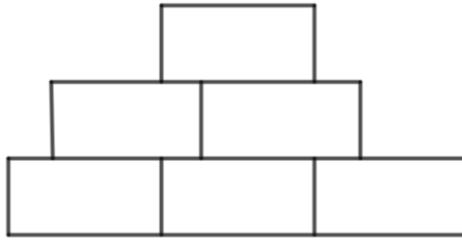
2. The sum of four consecutive even numbers is equal to m . What is the value of the largest of these numbers in terms of m ?
 (A) $\frac{m}{4} - 3$ (B) $3m$ (C) $\frac{m-12}{4}$ (D) $4m$ (E) $\frac{m+12}{4}$

3. An electric vehicle has two batteries, A and B . If battery A is $\frac{3}{8}$ charged and battery B is not used, the vehicle can travel 93 kilometres. If battery B is $\frac{9}{12}$ charged and battery A is not used, the car can travel 87 kilometres. If both batteries are fully charged, and the vehicle uses battery A until it is flat, then uses battery B , how far can the vehicle travel?
 (A) 180 km (B) 387 km (C) 410 km (D) 364 km (E) 296 km

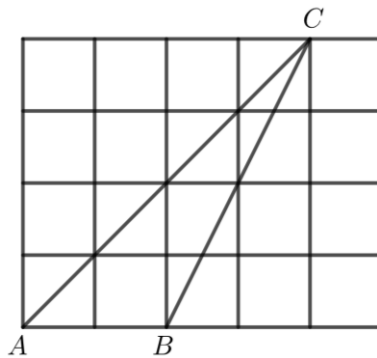
4. Seven pupils were each thinking of a different 2-digit number. The sum of their five numbers was 95. One of the pupils left, and the sum of the remaining six numbers was 82. What is the biggest possible number one of the original seven pupils was thinking about?
 (A) 22 (B) 16 (C) 21 (D) 18 (E) 20

5. I bought a bike for R1823 and sold it for R2023. I then bought it again for R2223 and sold it for R2423. What was my profit?
 (A) R0 (B) R300 (C) R600 (D) R400 (E) R200

6. Five identical rectangles are shown in the figure. The perimeter of each rectangle is 57cm. What is the perimeter of the whole figure in cm?



- (A) 214 (B) 184 (C) 228 (D) 150 (E) 171
7. What is the sum of all 3-digit natural numbers which are exactly 12 more than a 2-digit natural number?
- (A) 1155 (B) 1266 (C) 1378 (D) 1045 (E) 1491
8. Twenty identical squares, each with an area of 4, form a large rectangle as shown. Lines AC and BC are drawn forming $\triangle ABC$.



- What is the area of the rectangle excluding $\triangle ABC$?
- (A) 48 (B) 64 (C) 72 (D) 60 (E) 58

9. N is the product of all odd natural numbers 1 – 99 which do not end in a 5. (ie $N = 1 \times 3 \times 7 \times 9 \times \dots \times 93 \times 97 \times 99$) What is the last digit of N ?

- (A) 9 (B) 1 (C) 7 (D) 3 (E) 0

10. The average of 2023 consecutive odd integers is $(n + 10)$. What is the value of the smallest of these numbers in terms of n ?

- (A) $n - 1001$ (B) $n - 2022$ (C) $n - 2014$
 (D) $n - 2012$ (E) $n - 2032$

11. The numbers 1 – 8 repeat forever in a pattern as shown below:

1, 2, 3, 4, 5, 6, 7, 8, 8, 7, 6, 5, 4, 3, 2, 1, 1, 2, 3, 4,

What is the 2023rd number in the pattern?

- (A) 2 (B) 7 (C) 3 (D) 5 (E) 4

12. Eli starts reading a book on Monday and he reads 50 pages that day. The book has 2023 pages and he reads every day except on a Wednesday and on a Sunday. From Tuesday onwards, on the days he does read, Eli reads 40 more pages than on the previous day he read.

On which day of the week will Eli finish reading the book?

- (A) Saturday (B) Thursday (C) Monday (D) Friday (E) Tuesday

13. What is the value of: $2^{23} \times 23^2$?

- (A) 4 282 778 626 (B) 3 998 593 824 (C) 4 437 573 632
 (D) 4 069 882 698 (E) 4 642 794 860

14. A family travel by car on holiday. Every time they cross a bridge, they have to pay a bridge fee. The bridge fees are R5, R7, and R11 depending on the type of bridge crossed. Each type of bridge is crossed at least once, and the family paid a total of R84 in bridge fees by the time they reached their destination. What is the smallest number of bridges they crossed?

- (A) 8 (B) 10 (C) 12 (D) 11 (E) 9

15. Michael buys abc apples at three for R1, where abc is a 3-digit number. He then sells all the apples at five for R2, and makes a profit of R20. What is the value of $a + b + c$?

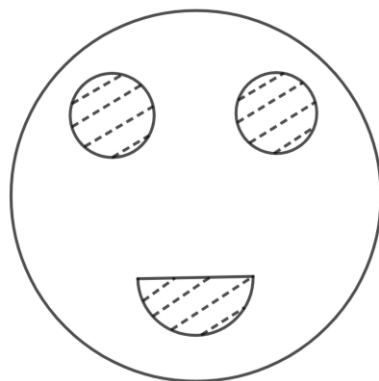
- (A) 7 (B) 8 (C) 4 (D) 6 (E) 3

16. A family leave home by car on a holiday. On the first day they travel $\frac{1}{4}$ of the total distance to their holiday home. On day two they travel $\frac{1}{3}$ of the remaining distance to their holiday home. On day three they travel $\frac{3}{4}$ of the remaining distance. On day four they arrive at their holiday home.

What percentage of the total distance did they travel on day four?

- (A) 12,5% (B) 15% (C) 10,75% (D) 14% (E) 12%

17. In the figure, the radius of the large circle is four times the radius of each of the two smaller circles, and twice the radius of the semi-circle. What fraction of the large circle is NOT shaded?



- (A) $\frac{2}{3}$ (B) $\frac{1}{4}$ (C) $\frac{1}{2}$ (D) $\frac{7}{8}$ (E) $\frac{3}{4}$

18. Four babies, $A, B, C,$ and D are weighed in pairs.

$$A + B = 8kg$$

$$B + C = 13kg$$

$$C + D = 11kg$$

$$D + A = 12kg$$

$$D + B = 10kg$$

$$A + C = 9kg$$

Babies $A, B, C,$ and D were then all weighed together.
What is the total weight of the four babies in kg ?

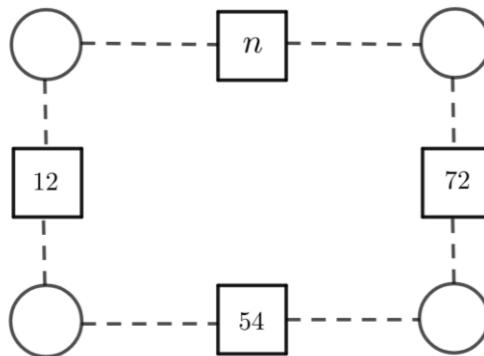
- (A) 24 (B) 20 (C) 21 (D) 19 (E) 23

19. $\sqrt{2023 \times 28} = abc$, where abc is a 3-digit whole number.

$$a + b + c = ?$$

- (A) 12 (B) 10 (C) 11 (D) 13 (E) 14

20. In the figure below, the number in each square is the product of the natural numbers in the circles on either side of it.



What is the value of the sum of the digits of the number n ?

- (A) 12 (B) 14 (C) 7 (D) 11 (E) 8