

PRIMARY SCHOOL CHALLENGE 2024

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 15 Questions over 3 Sections.**

Section A consists of 5 multiple choice questions. Each question is worth 1 mark. 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.

Section B consists of 5 questions where only an answer must be given. Each question is worth 2 marks. Write only your answer in the allocated space.

Section C consists of 5 questions where full working must be shown in the space provided. These questions are each worth 4 marks, and part marks may be awarded in this section only. Your final answer must be written in the allocated space.

3. Negative marking will not be applied.

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

5. Figures are not necessarily drawn to scale.

6. Answer all questions on the answer sheet provided.

7. Paper may be used for rough working.

SECTION A

1. What is the value of: $\frac{2+0+2+4}{0,25}$?

- A. 2 B. 80 C. 16 D. 4 E. 32

2. Twelve cards each have an *A* written on one side. Eight cards each have a *B* written on one side. Six cards have a *C* written on one side. The 26 cards are shuffled and randomly laid face down in a row. (The letters *A*, *B* and *C* are not visible)

What is the smallest number of cards which need to be turned over such that at least two *B*'s will definitely be showing?

- A. 18 B. 20 C. 2 D. 22 E. 14

3. Which fraction lies between the fractions $\frac{5}{36}$ and $\frac{1}{6}$?

- A. $\frac{9}{72}$ B. $\frac{2}{18}$ C. $\frac{12}{72}$ D. $\frac{23}{144}$ E. $\frac{51}{288}$

4. Which of the whole numbers *a*, *b*, *c*, *d*, or *e* is the largest if:

$$a - 4 = b + 1 = c - 6 = d + 4 = e - 7$$

- A. *a* B. *b* C. *c* D. *d* E. *e*

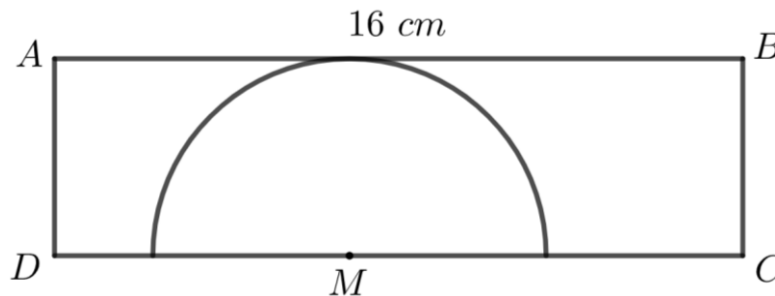
5. The sum of four consecutive positive odd numbers is m .
Which of the following is the largest of the four numbers?

A. $\frac{m}{4}$ B. $\frac{m}{4} - 4$ C. $\frac{m+6}{4}$ D. $\frac{m}{4} + 3$ E. $m - 4$

SECTION B

NB: Write only your answer in the allocated space.

6. In the figure a semi-circle with centre M is drawn inside the rectangle $ABCD$.
The semi-circle is tangent to side AB , and its area is $\frac{225}{8}\pi \text{ cm}^2$.
 $AB = 16\text{cm}$



What is the area of the rectangle $ABCD$?

7. Two whole numbers are in the ratio $1 : 5$. Their LCM (lowest common multiple) is 40.

What is the sum of the two numbers?

8. It's Ruth's birthday and her mother has baked her a cake. She has put the same number of candles on the cake as Ruth's age. The candles are all lit.
- On her first try, Ruth blows out $\frac{1}{3}$ of the candles.
 - On her second try, Ruth blows out $\frac{1}{4}$ of the number of candles originally lit on the cake.
 - On her third try, Ruth blows out $\frac{1}{8}$ of the number of candles originally lit on the cake.
 - On her fourth try, she blows out the remaining lit candles.

What is the youngest possible age of Ruth?

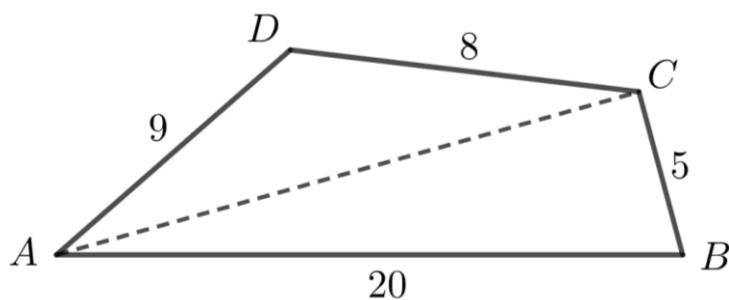
9. n is a positive integer. If 51 is divided by n , the remainder is 3. If 77 is divided by n , the remainder is 5.

What is the largest possible value of n ?

10. Quadrilateral $ABCD$ is shown in the figure.

$$AB = 20, \quad BC = 5, \quad CD = 8, \quad AD = 9$$

The length of AC is a whole number.



What is the whole number length of AC ?

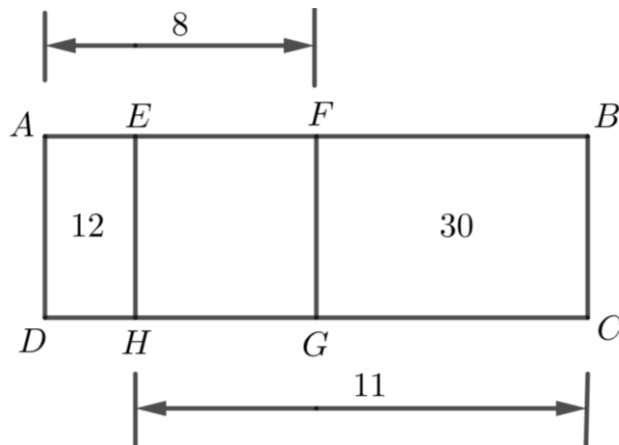
SECTION C

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

11. Consider natural numbers containing only odd digits.

How many different such natural numbers are there which have the sum of their digits equalling 7? (For example, 313 is one possibility)
(Show all working)

12. Rectangles $ABCD$, $AEHD$, $EFGH$, and $FBCG$ are shown in the figure.
Rectangle $AEHD$ has an area of 12. Rectangle $FBCG$ has an area of 30.
 $AF = 8$ and $HC = 11$



What is the area of $EFGH$?

(Show all working)

13. Sand is poured into a cylindrical cement flower pot. When the pot is $\frac{1}{4}$ full of sand, the pot and sand weigh 30kg. When the pot is $\frac{2}{3}$ full of sand, the pot and sand weigh 40kg.

What is the weight in kg of the flower pot on its own? (Show all working)

14. *GRADE* is a 5-digit whole number with different digits *G, R, A, D,* and *E*.

$GRADE \div 6$ and $GRADE \div 7$ are both whole numbers.

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

15. In a factory Machines *A* and *B* stick labels on boxes.

Machine *A* sticks 600 labels per hour and stops for 20 minutes after every full hour worked.

Machine *B* sticks 402 labels per hour and stops for 30 minutes after every full hour worked.

On a certain day both machines begin working together.

After how many minutes will the two machines working together have stuck a total of 2024 labels on the boxes?

(Show all working)

***** END *****