

PRIMARY SCHOOL
CHALLENGE 2024

LEVEL 2 CHALLENGE
GRADE 6 AND 7 ROUND ONE

INSTRUCTIONS

1. The time allocated for this paper is 1 hour.
2. All participants must remain for the full allocated time.
3. Under no circumstances may extra time be given.
4. **This paper consists of 20 Questions over 2 Sections.**

Section A consists of 15 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. No mark will be awarded if two or more letters are circled without any crossing out.

Section B consists of 5 questions where only an answer must be given. Each question is worth 1 mark. Write only your answer in the allocated space.

5. Negative marking will not be applied. That is, marks will not be deducted for an incorrect answer.
6. Calculators (and other calculating devices) and geometry instruments are not allowed.
7. Figures are not necessarily drawn to scale.
8. Answer all questions on the answer sheet provided.
9. Paper may be used for rough working.

ENJOY AND HAVE FUN 😊

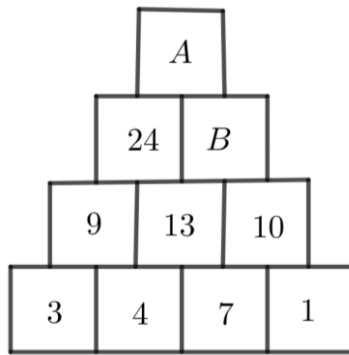
SECTION A

1. What is the value of: $2024 - (2 + 0 + 2 + 4)$?

- (A) 2020 (B) 2032 (C) 2016 (D) 2018 (E) 2014

2. A number pattern is hidden in the figure below.

What is the value of the sum of the numbers in blocks *A* and *B* ?



- (A) 76 (B) 70 (C) 74 (D) 68 (E) 81

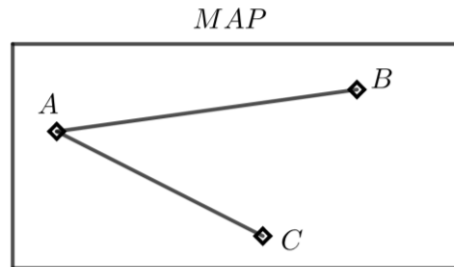
3. The multiples of 2 and 3 are all removed from the set of whole numbers 1 to 20. How many prime numbers remain?

- (A) 7 (B) 9 (C) 8 (D) 5 (E) 6

4. What is the sum of the digits of the positive difference between the largest 4-digit number you can make with the digits 2175 and the smallest 4-digit number you can make with the same digits? (eg, the sum of digits of say 5482 is 19)

- (A) 18 (B) 24 (C) 13 (D) 16 (E) 20

5. On a true-to-scale map, the distance between cities A and B measures 15cm, and the distance between cities A and C measures 12cm. The actual straight line distance on the ground between cities A and B is 450km.



What is the actual straight line distance on the ground between cities A and C ?

- (A) 400km (B) 240km (C) 350km (D) 360km (E) 300km
6. Themba is asked to multiply the fractions $\frac{3}{4}$ and $1\frac{1}{3}$. Cindy is asked to add these two fractions.

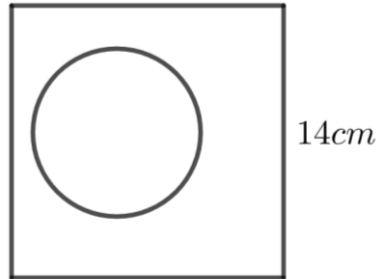
What is the positive difference between their answers?

- (A) $\frac{5}{4}$ (B) $\frac{4}{5}$ (C) $1\frac{1}{2}$ (D) $\frac{12}{13}$ (E) $1\frac{1}{12}$
7. What is the units digit of the product of the first 2024 prime numbers?
- (A) 0 (B) 6 (C) 8 (D) 2 (E) 4
8. The odd number $N222 \dots \dots 22M$ has 2024 digits. Every digit between N and M is a 2.

What is the smallest possible value of $N + M$ if this number is divisible by 15?

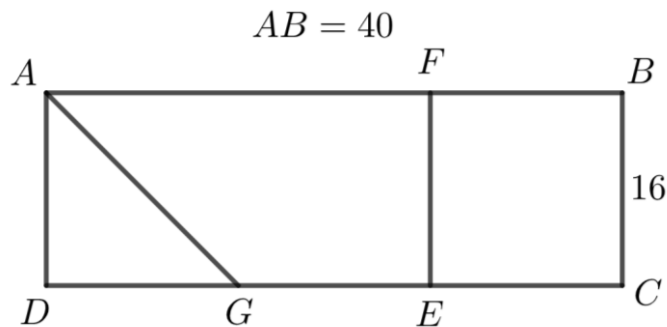
- (A) 7 (B) 5 (C) 8 (D) 1 (E) 6

9. A circle is drawn anywhere inside the square of side 14cm below.



What is the largest possible area of the circle if no part of it falls outside the square? Use $\pi = \frac{22}{7}$

- (A) 140cm^2 (B) 114cm^2 (C) 186cm^2 (D) 154cm^2 (E) 160cm^2
10. In the diagram below, $ABCD$ is a rectangle with sides 40 and 16. $BCEF$ is a square and ADG is an isosceles triangle.



What is the area of the trapezium $AFEG$?

- (A) 240 (B) 248 (C) 256 (D) 264 (E) 238

11. What is the smallest positive difference between a perfect square and 2024?

- (A) 88 (B) 92 (C) 1 (D) 24 (E) 42

12. We often use the four operations $+$; $-$; \times ; \div in mathematics.

A special operation \odot is made up for this question. Carefully study the three examples which use this special operation below to see what it is doing. Then answer the question.

$$3 \odot 12 = 6$$

$$3 \odot 27 = 9$$

$$2 \odot 8 = 4$$

What is the value of $6 \odot (4 \odot 9)$?

- (A) 12 (B) 6 (C) 8 (D) 10 (E) 7

13. Tarryn is completing a jigsaw puzzle. When the puzzle is $\frac{5}{7}$ complete, she counts the number of remaining pieces. If she counted 160 pieces, how many pieces does the crossword puzzle have?

- (A) 1000 (B) 245 (C) 650 (D) 560 (E) 500

14. What is the value of the following product:

$$\left(1 + \frac{1}{3}\right) \times \left(1 + \frac{1}{4}\right) \times \left(1 + \frac{1}{5}\right) \times \left(1 + \frac{1}{6}\right) \times \dots \times \left(1 + \frac{1}{2024}\right) ?$$

- (A) 1012 (B) 780 (C) 2024 (D) 1024 (E) 675

15. How many of the following statements are always true?

- A natural number divided by a natural number is always a natural number.
- An even number multiplied by an odd number is always an odd number.
- A perfect square multiplied by a perfect square is always a perfect square.
- An even number added to an odd number is always an odd number.
- An odd number plus 1 is always an even number.

(A) 1

(B) 2

(C) 3

(D) 4

(E) 5

SECTION B

(Write your answer only in the allocated space)

16. There are 128 coins in a jar.

Eli puts his hand into the jar and takes out half the coins. He then keeps repeating this, taking out half of the coins left in the jar each time.

How many times does Eli take out half the coins in the jar before there is only one coin left in the jar?

17. Sandile starts reading a book at 9.00am. He reads exactly 6 pages every 10 minutes and he finished reading the book at 11.45am on the same day.

During the time he was reading, he took a 15 minute break to have a snack.

How many pages were in the book if it took him exactly the same amount of time to read each page?

18. The 6-digit number $1862t0$ is divisible by 8. t is the tens digit.

How many different values of t are possible?

19. The sum of five different natural numbers is 39.
Two of the numbers are greater than 10.
Three of the numbers are odd and the others are even.

What is the value of the largest possible odd number?

20. A special code uses the letters of the alphabet to make numbers.

Alphabet: A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Three examples of the code are shown below. Carefully study these examples to find the code, then answer the question.

$$ONE = 54$$

$$TWO = 73$$

$$TEN = 44$$

What is the value of *SIX* ?

***** END *****