BEYOND MATHS

PRIMARY SCHOOL CHALLENGE 2021

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 $(2021 - 1021) \div 2 + 50 \times 10$?

(A) 5500 (B) 2021 (C) 1000 (D) 1500 (E) 1021

2. Two prime numbers multiply together to give the number 334. What is the total sum of all the digits of both prime numbers?

(A) 10 (B) 13 (C) 21 (D) 16 (E) 14

3. It's 2021. Brian has five friends aged 13, 12, 14, 15, and 12. In 2041 the total sum of their six ages will be 198. How old is Brian in 2021?

(A) 13 (B) 12 (C) 15 (D) 11 (E) 14

4. Which of the following is the smallest?

(A) $\frac{1}{2} \times 42$ (B) $63 \div 3$ (C) 20 (D) $\frac{1}{3} \times 57$ (E) $\frac{1}{5} \times 105$

5. Two new operations are defined as follows:

$$A \otimes B = 2 \times A \times B \qquad and \qquad A \triangle B = 2 \times A - B$$

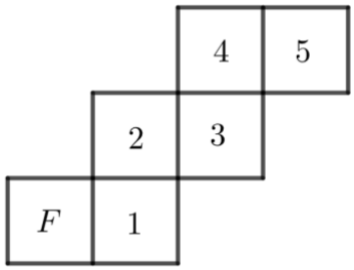
What is the value of: $(3 \triangle 2) + (7 \otimes 1)$?

(A) 18 (B) 11 (C) 15 (D) 22 (E) 16

6. A water tank is $\frac{2}{7}$ full. The capacity of the tank is 5600 litres. How many litres of water must be added to the tank to make it $\frac{5}{8}$ full?

(A) 2100 (B) 1850 (C) 2000 (D) 1900 (E) 2700

7. The net in the figure below may be folded into a cube. Which number will be on the face opposite face F ?



(A) 1 (B) 2 (C) 3 (D) 4 (E) 5

8. In the table below, the numbers in <u>each</u> column have the <u>same</u> relationship between U and V.

U	$0,5$	5	$2,25$	$7,5$
V	7	16	$10,5$	21

Which of the following correctly represents U?

(A) $V \times 2 - 13{,}5$ (B) $1 + \frac{V}{4}$ (C) $0{,}5 \times V + \frac{3}{2}$

(D) $V - \frac{V}{2} - 3$ (E) $\frac{V}{2} + 3$

9. On a map, a measured length of 1 centimetre represents 20 kilometres on the actual ground represented by the map. Brenda measures a length of 17 millimetres between two points on the map. How far apart are the two points on the actual ground in kilometres?

(A) 17 (B) 44 (C) 37 (D) 34 (E) 47

10. How old was Alan 8 years ago if m years ago he was n years old?

(A) $n + m + 8$ (B) $m - n - 8$ (C) $m - n + 8$

(D) $n + m - 8$ (E) $n - m - 8$

11. If $\frac{70}{210} = \frac{35}{E} = \frac{F}{3} = \frac{G}{21} = \frac{14}{H}$, then what is the value of $E + F + G + H$?

(A) 155 (B) 135 (C) 140 (D) 165 (E) 55

12. In a game between four teams, Team B scored 35 points. Team A scored 5 less than Team C. Team D scored 2 more than Team C, and 15 less than Team B. How many points did Team A score?

(A) 43 (B) 13 (C) 17 (D) 18 (E) 23

13. What is the value of: $2021 + 20 - 21 + 2 - 0 + 2 - 1$?

(A) 2003 (B) 2020 (C) 2024 (D) 2023 (E) 2045

14. If M and N are fractions between -1 and 1, which of the following is true?

(A) $M \times N$ is always negative (B) $M + N$ is always zero

(C) $M \times N$ is always greater than 1 (D) $M + N$ is always positive

(E) $M \times N$ is always less than 1

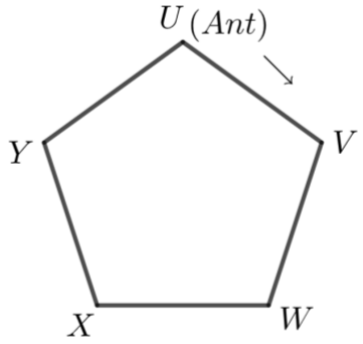
15. Four new operations are defined as follows:

- $N \uparrow$ means $N \times 2$
- $N \downarrow$ means $N \div 2$
- $N \rightarrow$ means $N + 2$
- $N \leftarrow$ means $N - 2$

What is the value of: $4 \uparrow (4 \rightarrow) - 4 \downarrow (4 \leftarrow)$?

(A) 34 (B) 14 (C) 4 (D) 24 (E) 44

16. The figure shows a regular pentagon $UVWXY$ with sides $8cm$. An ant is sitting at U. The ant begins to crawl in a clockwise direction around the perimeter of the pentagon. The ant crawls at a speed of $1cm$ per second (1 centimetre per second), but every time the ant reaches points V and X, it rests for 15 seconds before continuing. After $4\frac{1}{2}$ minutes since starting at U, the ant finally stops crawling. On which side of the pentagon did the ant finally stop on?

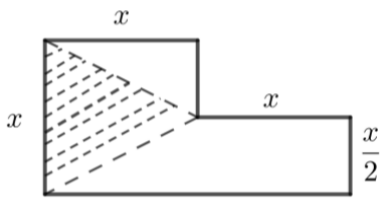


(A) UV (B) VW (C) WX (D) XY (E) YU

17. Given the expression $\sqrt{5120 \times k}$ where k is a whole number. What is the <u>smallest</u> value of k which will make this expression a whole number?

(A) 2 (B) 5 (C) 4 (D) 6 (E) 3

18. The figure below is made up of a square and a rectangle. The square has sides length x units. What fraction of the whole area of the given figure is hatched in dotted lines? (The fraction must be in its <u>simplest form</u>)



(A) $\frac{1}{2}$ (B) $\frac{1}{3}$ (C) $\frac{1}{4}$ (D) $\frac{3}{8}$ (E) $\frac{2}{5}$

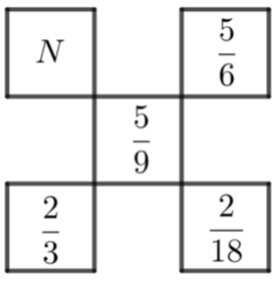
19. Using each digit from the number 2021 only once (2 must be used twice), what is the value of the expression below if:

- $x = largest\ possible\ 4-digit\ number\ using\ the\ digits$
- $y = smallest\ possible\ 4-digit\ number\ using\ the\ digits$

$$\frac{1}{2}(x-y)+y\ ?$$

(A) 1710,5 (B) 1715 (C) 1616 (D) 1507 (E) 1601,5

20. A hidden multiplication number pattern is shown in the figure below. What is the value of N ?



(A) 3 (B) $\frac{1}{9}$ (C) 5 (D) $\frac{3}{18}$ (E) $\frac{1}{6}$

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