

PRIMARY SCHOOL
CHALLENGE 2016

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 two sections.
Section A consists of 15 multiple choice questions.
Section B consists of 5 questions where working out must be shown.
3. Question 1 – 15 are worth 2 marks each.
Question 16 – 20 are worth 4 marks each.
4. Negative marking will not be applied.
5. Calculators (and other calculating devices) and geometry instruments are not allowed.
6. Figures are not necessarily drawn to scale.
7. Answer all questions on the answer sheet provided.
8. Circle the letter you have chosen as your answer in pen for Section A (questions 1 – 15).
Should you wish to change an answer, put a cross over the letter and then circle your new chosen letter.
9. For Section B (questions 16 – 20), full working must be shown in the space provided.
Your final answer must be written in the allocated space.
10. Paper may be used for rough working.

SECTION A

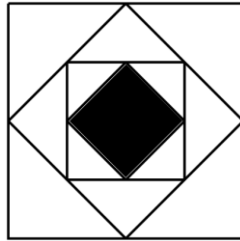
1. A prime number is called a “Superprime” if doubling it and then subtracting 1 results in another prime number. The sum of all Superprimes less than 23 is

(A) 41 (B) 31 (C) 23 (D) 21 (E) 8

2. The difference between the largest and smallest numbers (a number cannot begin with zero) that can be made with digits of 2, 0, 1 and 6 is

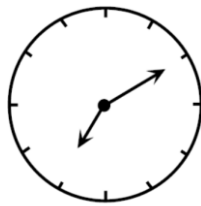
(A) 4806 (B) 4986 (C) 5094 (D) 5175 (E) 5184

3. The midpoints of the sides of a different sized squares are joined as shown below. The fraction of the largest square that is shaded is



(A) $\frac{1}{16}$ (B) $\frac{1}{8}$ (C) $\frac{1}{6}$ (D) $\frac{1}{4}$ (E) $\frac{1}{3}$

4. Emily sits on a chair in a room. Behind her is a clock. In front of her is a mirror. In the mirror, she sees the image of the clock as shown. The actual time is closest to



(A) 7:10 (B) 6:50 (C) 5:10 (D) 4:50 (E) 4:10

5. 1000% of 4 equals

(A) 40 (B) 400 (C) 4000 (D) 1004 (E) 0,004

6. Pablo spills a box of 500 spaghetti strands, each 12 cm long, onto the floor. If he lay them end to end to form one long strand, the continuous length of spaghetti strands would be

(A) 6 000 mm (B) 60 000 cm (C) 60 m (D) 6 000 cm (E) 6 km

7. Starting at 2016 and counting backwards by 7's, a student counts 2009, 2002, 1995, etc. A number that will be counted is

- (A) 108 (B) 107 (C) 106 (D) 105 (E) 104

8. In the addition shown, P and Q each represent single digits, and the sum is 1PP7. The sum of P + Q is

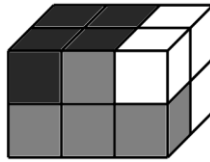
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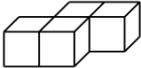
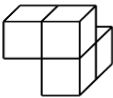
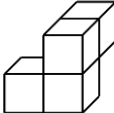
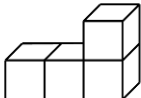
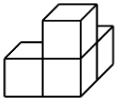
- (A) 15 (B) 14 (C) 13 (D) 12 (E) 9

9. Three pumpkins are weighed two at a time in all possible ways. The weights of the pairs of pumpkins are 12 kg, 13 kg and 15 kg. How much does the lightest pumpkin weigh?

- (A) 8 kg (B) 7 kg (C) 5 kg (D) 4 kg (E) 3 kg

10. A rectangular wooden prism is made up of three pieces, each consisting of four cubes of wood glued together. Which of the pieces below has the same shape as the black piece?



- (A)  (B)  (C)  (D)  (E) 

11. In a car park there are several rows of cars, with the same number of cars in each row. If there is one more row of cars, but one less car in each row, the total number of cars will decrease by one.

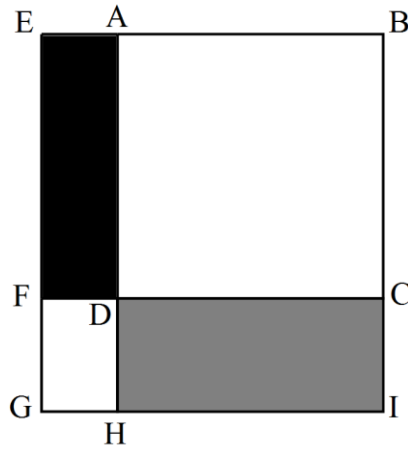
The number of cars must be

- (A) a prime number (B) a power of 2 (C) a perfect square (D) a perfect cube (E) none of these

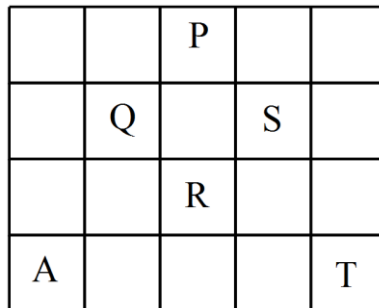
12. Only one of the following statements below is true. Which one?

- (A) B is true (B) E is false (C) Statements A to E are true (D) Statements A to E are false (E) A is false

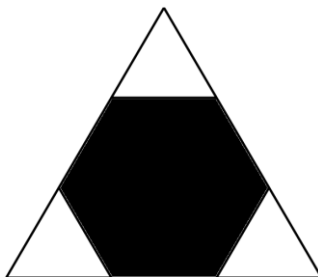
13. A rectangle is divided into three rectangles of different areas and square ABCD. The area of rectangle EADF is 42 cm^2 and the area of rectangle DCIH is 66 cm^2 . If all the rectangles have lengths and widths that are whole numbers, the area of the squares ABCD, in cm^2 , could be



- (A) 81 cm^2 (B) 64 cm^2 (C) 49 cm^2 (D) 36 cm^2 (E) 25 cm^2
14. A game is played on the grid board shown below. In this game, a player can move three blocks in any direction (up, down, right or left) and then can move two blocks in a direction perpendicular to the first move. If a player starts in block A, which block on the board (P, Q, R, S or T) cannot be reached through any sequence of moves?



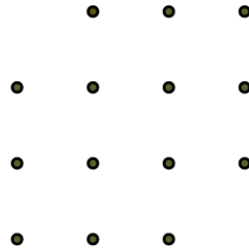
- (A) P (B) Q (C) R (D) S (E) T
15. A regular hexagon fits inside an equilateral triangle. If the hexagon has an area of 30 cm^2 , what is the area of the triangle?



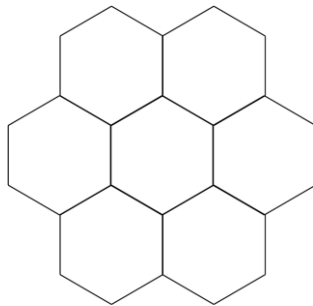
- (A) 42 cm^2 (B) 45 cm^2 (C) 50 cm^2 (D) 55 cm^2 (E) 65 cm^2

SECTION B

16. A four-digit number is divisible by 3 and 8 and only has the digits 1 and 2. What is the minimum sum of all the digits of this number?
17. The top left and bottom right corners of an equally spaced 4×4 arrangement have been removed as shown in the diagram below. Determine the number of different squares that can be formed using the 14 dots.



18. What is the largest possible remainder when a two-digit number is divided by the sum of its digits?
19. How many ways are there to colour the hexagonal regions of the diagram below with the three colours red, green, and blue so that no two adjacent regions are coloured the same?



20. A special game of chess only uses queens. What is the minimum number of queens needed to threaten every block on the 5×5 chess board below? (Remember that a queen can attack vertical, horizontally and diagonally).

