

Secondary 2 (GRADE 8) SAMPLE PAPER

Q1

The difference between any two consecutive numbers in the list  $a, b, c, d, e$  is the same. If  $b = 5.5$  and  $e = 10$ , what is the value of  $a$ ?

- A. 4.0
- B. 4.5
- C. 5.0
- D. 5.5
- E. None of the above

Q2

The following are the number of fishes that Tyler caught in nine outings last summer: 2, 0, 1, 3, 0, 3, 3, 1, 2. Which statement about the mean, median, and mode is true?

- A. median  $<$  mean  $<$  mode
- B. mean  $<$  mode  $<$  median
- C. mean  $<$  median  $<$  mode
- D. median  $<$  mode  $<$  mean
- E. mode  $<$  median  $<$  mean

Q3

A city is divided into four regions. The city council has decided that a new city hall, a new school, and a new movie theatre shall be built. The only condition is that the school and the movie theatre must not be in the same region. How many ways these four buildings be built in the city? (*Ignore the time of construction*)

- A. 4
- B. 16
- C. 24
- D. 48
- E. 64

Q4

Which one of the following numbers is equal to  $4^7 \times 2^4$ ?

- A.  $8^3$
- B.  $8^6$
- C.  $8^{11}$
- D.  $8^{14}$
- E.  $8^{28}$

Q5

Which one of the following numbers is equal to  $\frac{2017^4 - 2016^4}{2017^2 + 2016^2}$ ?

- A. 2016
- B. 4031
- C. 4033
- D.  $2 \times (2017^2 - 2016^2)$
- E.  $2016 \times 2017$

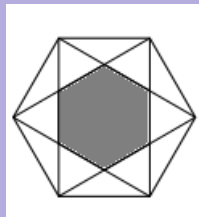
Q6

Which one of these numbers must be placed in the middle (3<sup>rd</sup>) if they are to be arranged in increasing or decreasing order?

- A.  $\pi$
- B.  $\sqrt{12}$
- C.  $\frac{7}{2}$
- D.  $\frac{\sqrt{11} + \sqrt{13}}{2}$
- E.  $\frac{2}{\frac{1}{\sqrt{11}} + \frac{1}{\sqrt{13}}}$

Q7

There are two regular hexagons in the picture. What is the ratio of the area of the larger one to that of the smaller one?



- A. 2:1
- B. 3:1
- C.  $2\sqrt{3}:1$
- D. 4:1
- E. None of the above

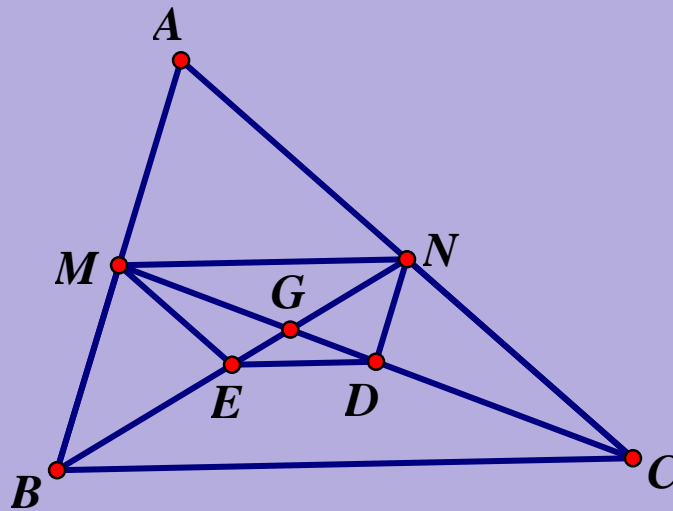
Q8

For each positive integer  $n$ , define  $S(n)$  to be the smallest positive integer divisible by each of the positive integers  $1, 2, 3, \dots, n$ . For example,  $S(5) = 60$ . How many positive integers  $n$  are there such that  $1 \leq n \leq 100$  and  $S(n) = S(n + 4)$ ?

Q9

In triangle  $ABC$ , points  $M, N$  are the midpoints of  $AB, AC$ , respectively. Let  $D, E$  be the midpoints of  $CM, BN$ , respectively. Find the value of

$$\frac{\text{Area of } ABC}{\text{Area of } BCDE + \text{Area of } MNDE}$$



Q10

One of the famous Hungarian mathematicians lived all his life in the 19<sup>th</sup> century (1801-1900). Three of the digits in his year of birth and his year of death are the same. His birth year is a multiple of 17, and his year of death is a multiple of 31. If he lived for more than 50 years, what year was he born?