



Singapore & Asian Schools  
Math Olympiad

## **Primary 6 (Grade 6) – GEP Practice**

### **2019 Contest Problems with Full Solutions**

#### **Authors:**

**Henry Ong, BSc, MBA, CMA  
Merlan Nagidulin, BSc**

**© Singapore International Mastery Contests Centre (SIMCC)  
All Rights Reserved**

No part of this work may be reproduced or transmitted by any means, electronic or mechanical, including photocopying and recording, or by any information or retrieval system, without the prior permission of the publisher.

**Section A** (Correct answer – 2 points | No answer – 0 points | Incorrect answer – minus 1 point)

**Question 1**

Find the sum of all digits of the following product

$$693 \times 333$$

- A. 230769
- B. 229669
- C. 27
- D. 34
- E. None of the above

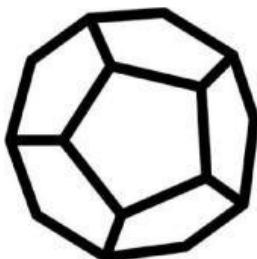
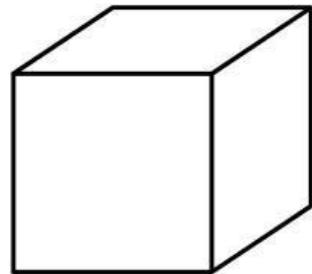
**Question 2**

In a school, 52 students were given vouchers for a bookstore or cafeteria. Twenty of them received bookstore vouchers and 39 students received cafeteria vouchers. How many students received both vouchers?

- A. 8
- B. 9
- C. 10
- D. 11
- E. None of the above

**Question 3**

A cube is a solid consisting of identical squares. A cube has 6 faces. A “dodecahedron” is a solid consisting of identical pentagons (5-sided shapes), as illustrated below. If a dodecahedron has 12 faces, how many edges does it have?



- A. 5
- B. 20
- C. 12
- D. 30
- E. None of the above

**Question 4**

William has 3 books: Charlotte’s Web, Little Prince and Hobbit. How many ways can he arrange these books in a row such that Hobbit and Charlotte’s Web are next to each other?

- A. 6
- B. 2
- C. 4
- D. 12
- E. None of the above

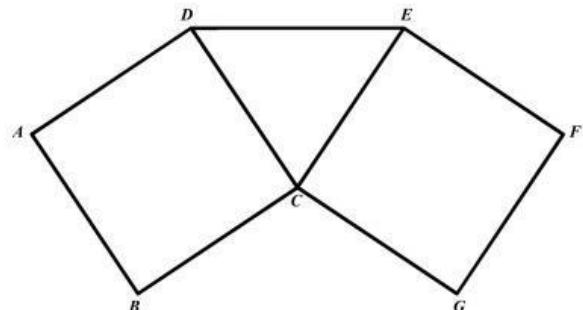
**Question 5**

Clayton gave 77 baseball cards to his friend and 112 baseball cards to his brother. In the end, Clayton is left with 441 baseball cards. What percentage of his original number of cards did Clayton give away?

- A. 70%
- B. 60%
- C. 40%
- D. 30%
- E. None of the above

**Question 6**

In the diagram,  $ABCD$  and  $CEFG$  are squares, and  $CED$  is an equilateral triangle. Find the measurement (in degrees) of the angle  $\angle EAC$ .



- A.  $45^\circ$
- B.  $36^\circ$
- C.  $32^\circ$
- D.  $30^\circ$
- E. None of the above

**Question 7**

Annabelle, Betty, Cynthia and Dora are playing a new video game. After the first round of the game:

- Cynthia's number of gold coins is equal to the average number of gold coins Annabelle and Betty have.
- Annabelle's number of gold coins is half of Betty's.
- Betty and Dora got the same number of gold coins.
- Dora got 10 more gold coins than Cynthia.

What is their total number of gold coins after the first round?

- A. 140
- B. 130
- C. 70
- D. Insufficient data
- E. None of the above

**Question 8**

Each of the 3-digit numbers  $ABC$ ,  $BCA$  and  $CAB$  is even and divisible by 9. If  $A$ ,  $B$  and  $C$  are different digits, find the value of  $A + B + C$ .

- A. 18
- B. 9
- C. 20
- D. 12
- E. None of the above

**Question 9**

Consider all the whole numbers from 1 to 50. Which of the following is NOT true about them?

- A. The number of even numbers is the same as the number of odd numbers.
- B. Writing all the digits, the digit "0" is the least occurring digit.
- C. There are more 2-digit numbers than 1-digit numbers.
- D. The number of multiples of 5 is the same as the number of multiples of 7.
- E. The average of the 50 numbers is not a whole number.

**Question 10**

A pipe can fill up an empty tank with water in 4 hours. However, due to the leakage in the tank, the pipe fills the empty tank in 12 hours. If the tank is full of water and the pipe is removed, how long will the leakage take to empty the full tank?

- A. 6 hours
- B. 8 hours
- C. 9 hours
- D. 16 hours
- E. None of the above

**Question 11**

Seventy days after the day before yesterday is Friday. Which day of the week is tomorrow?

- A. Friday
- B. Saturday
- C. Sunday
- D. Thursday
- E. None of the above

**Question 12**

At 12 p.m., the hour and minute hand point in the same direction. What is the exact time between 6 p.m. and 7 p.m. when the hour and minute hand point in the same direction?

- A. 6.30 p.m.
- B.  $6:32\frac{8}{11}$  p.m.
- C.  $6:33\frac{3}{11}$  p.m.
- D.  $6:32\frac{7}{11}$  p.m.
- E. None of the above

**Question 13**

Four athletes run in a marathon, and made the following statements:

- Tom: I'm the fastest.
- Jack: I'm the slowest.
- Lionel: I'm neither the slowest nor the fastest.
- Robert: I'm not the fastest.

If exactly 3 of them are telling the truth, who is the slowest?

- A. Tom
- B. Jack
- C. Lionel
- D. Robert
- E. Insufficient data

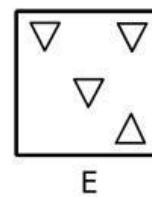
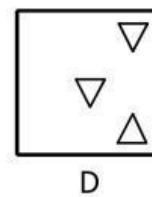
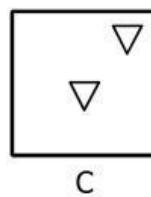
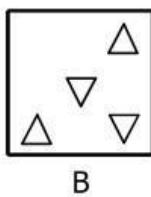
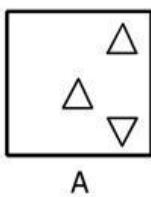
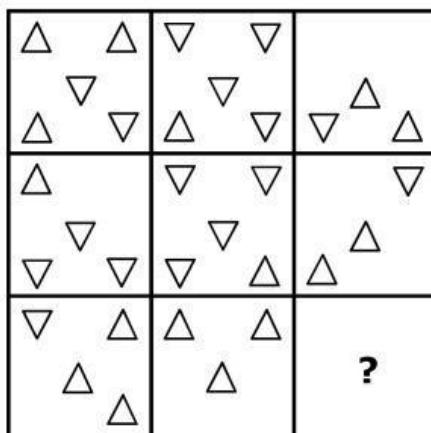
**Question 14**

The product of all whole numbers from 2 to M is a multiple of 1365. What is the least possible value of M?

- A. 13
- B. 15
- C. 65
- D. 1365
- E. None of the above

**Question 15**

Find the missing figure in the diagram below.



**Section B (Correct answer – 4 points | Incorrect or No answer – 0 points)**

When an answer is a 1-digit number, shade "0" for the tens, hundreds and thousands place.

*Example: if the answer is 7, then shade 0007*

When an answer is a 2-digit number, shade "0" for the hundreds and thousands place.

*Example: if the answer is 23, then shade 0023*

When an answer is a 3-digit number, shade "0" for the thousands place.

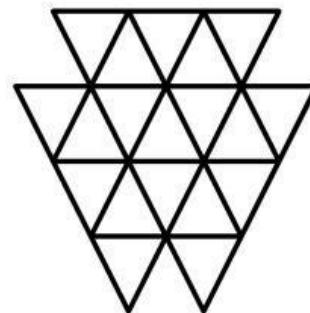
*Example: if the answer is 785, then shade 0785*

When an answer is a 4-digit number, shade as it is.

*Example: if the answer is 4196, then shade 4196*

**Question 16**

How many triangles are there in the diagram?



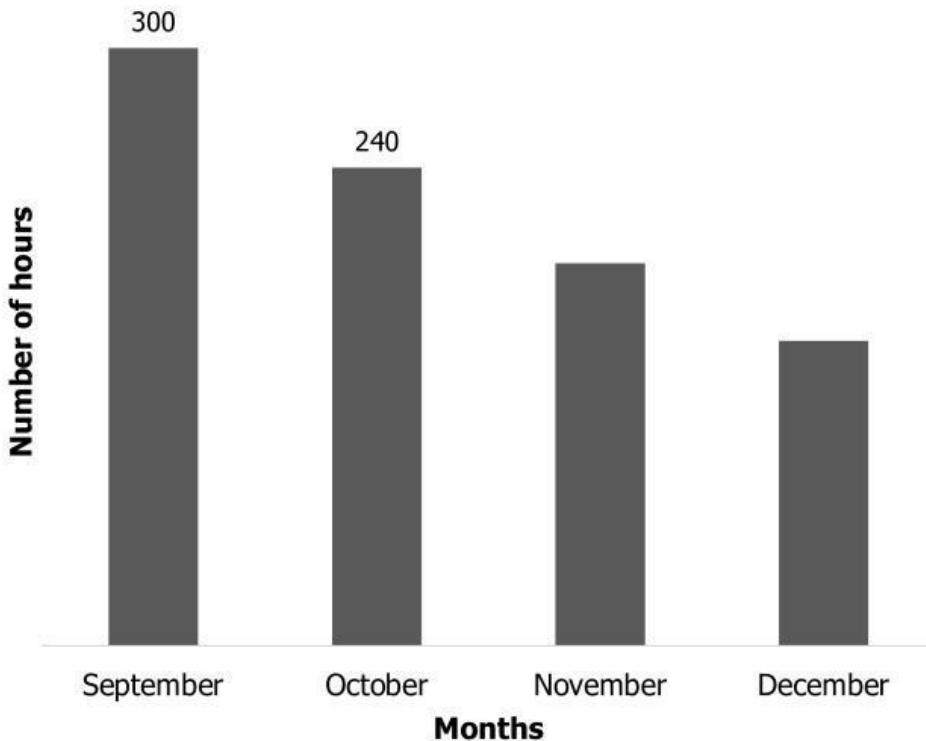
**Question 17**

Find the numerator of the following sum in its simplest form.

$$\frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots + \frac{1}{128}$$

**Question 18**

The following bar chart shows Nicki's usage time of her phone in four months. The percentage decrease in the amount of usage time remains the same every following month. Find Nicki's total number of usage time, in hours, during these four months. Round off your answer to the nearest whole number.



**Question 19**

What is the missing number in the sequence below?

131, 228, 331, 430, 531, 630, 731, ?, 930

**Question 20**

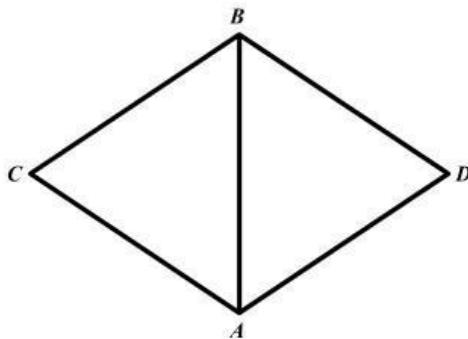
Andrew, Barry, Cassie and Drake bought some candies from a grocery shop. The number of candies Andrew bought is equal to  $\frac{1}{3}$  of the total number of candies of Barry, Cassie and Drake. Barry's number of candies is equal to 25% of the total number of candies of Andrew, Cassie and Drake. The ratio of Cassie's candies to the total number of candies of the other three is 2:5. Drake bought 3 candies less than Cassie. How many candies did four of them buy altogether?

**Question 21**

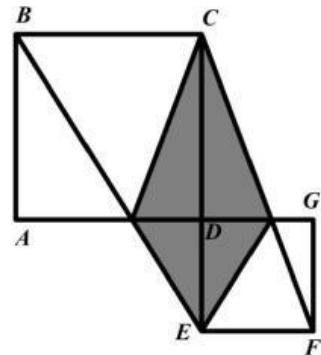
Tom selected 30 different whole numbers such that the product of any 11 numbers is always even. The sum of the 30 numbers is an odd number. Find the least possible sum of these numbers.

**Question 22**

The diagram below shows triangular tracks  $ABC$  and  $ABD$  from the above. Triangles  $ABC$  and  $ABD$  are equilateral, and the perimeter of the triangular track  $ABC$  is 168 metres. Matt runs around the track in the direction  $A \rightarrow B \rightarrow C \rightarrow A$  at 3 m/s (metres per second). Jack runs around the track in the direction  $A \rightarrow B \rightarrow D \rightarrow A$  at 7 m/s. If Matt and Jack start running from point  $A$  at the same time, how many seconds later will they meet each other for the first time at point  $A$ ?

**Question 23**

In the diagram,  $ABCD$  and  $DEFG$  are squares with  $AB = 9$  cm and  $DE = 5$  cm. If  $\angle CDG = 90^\circ$ , find the area (in  $\text{cm}^2$ ) of the shaded quadrilateral.



**Question 24**

In the following cryptarithm, all the different letters stand for different digits. What is the value of the sum O + D + A + G?

$$\begin{array}{r} \text{G} \quad \text{O} \quad \text{O} \quad \text{D} \\ + \quad \quad \text{D} \quad \text{O} \quad \text{G} \\ \hline \text{D} \quad \text{G} \quad \text{D} \quad \text{A} \end{array}$$

**Question 25**

January 23, 2019 can be written as 8-digit date format 23/01/2019. September 2, 2019 can be written as 8-digit date format 02/09/2019. How many digit “1” are there in all 8-digit dates of the year 2019?

(For example, the date 25/01/2019 consists two “1” digits)

**END OF PAPER**

## Solutions to SASMO 2019 Primary 6 (Grade 6)

### Question 1

$$\begin{aligned}693 \times 333 &= (3 \times 231) \times 333 = 231 \times 3 \times 333 = 231 \times 999 = 231 \times (1000 - 1) \\&= 231 \times 1000 - 231 \times 1 = 231000 - 231 = 230769.\end{aligned}$$

The sum of the digits is  $2 + 3 + 0 + 7 + 6 + 9 = 27$ .

Answer: (C)

### Question 2

$20 + 39 = 59$  vouchers were given

$59 - 52 = 7$  students received both vouchers

Answer: (E)

### Question 3

Each face has 5 edges. Then

$12 \text{ faces} \times 5 \text{ edges} = 60 \text{ edges}$

However, every edge has been counted twice as there are 2 faces sharing the same edge.

Thus, a dodecahedron has  $60 \div 2 = \mathbf{30 \text{ edges}}$ .

Answer: (D)

### Question 4

1) Hobbit – Charlotte’s Web – Little Prince

2) Charlotte’s Web – Hobbit – Little Prince

3) Little Prince – Hobbit – Charlotte’s Web

4) Little Prince – Charlotte’s Web – Hobbit

There are **4 ways** of arrangement as shown above.

Answer: (C)