Singapore & Asian Schools Math Olympiad

Primary 6 (Grade 6) – GEP Practice

2020

Contest Problems with Full Solutions

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LIVEWORKSHEETS

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

Question 1

Find the value of the following.

$$2020 \times 2020 - 2019 \times 2021$$

A. 2020
B. 4040
C. 1
D. 2
E. None of the above

Question 2

What is the next number in the following pattern?

$$1,2,6,15,31,56, \ldots$$

A. 92
B. 81
C. 105
D. 78
E. None of the above

Question 3

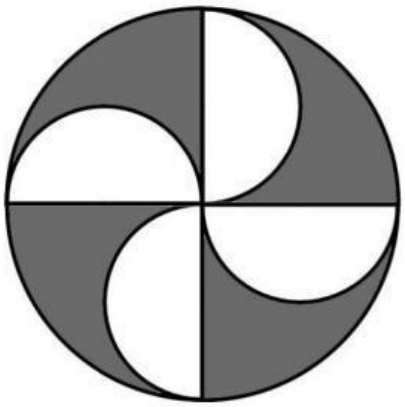
In a supermarket, the chicken nuggets are only available in packs of either 3 or 7 nuggets. For example, you cannot purchase exactly 2, 5 or 8 nuggets. What is the largest number of chicken nuggets that one cannot purchase?

A. 231
B. 721
C. 23
D. 13
E. None of the above

LIVEWORKSHEETS

Question 4

In the diagram, the unshaded area is made of 4 semicircles touching at the centre of the large circle. If the diameter of the large circle is 28 cm, find the area of the shaded region. (Use $\pi = \frac{22}{7}$)



A. 616 cm^2
B. 462 cm^2
C. 308 cm^2
D. 154 cm^2
E. None of the above

Question 5

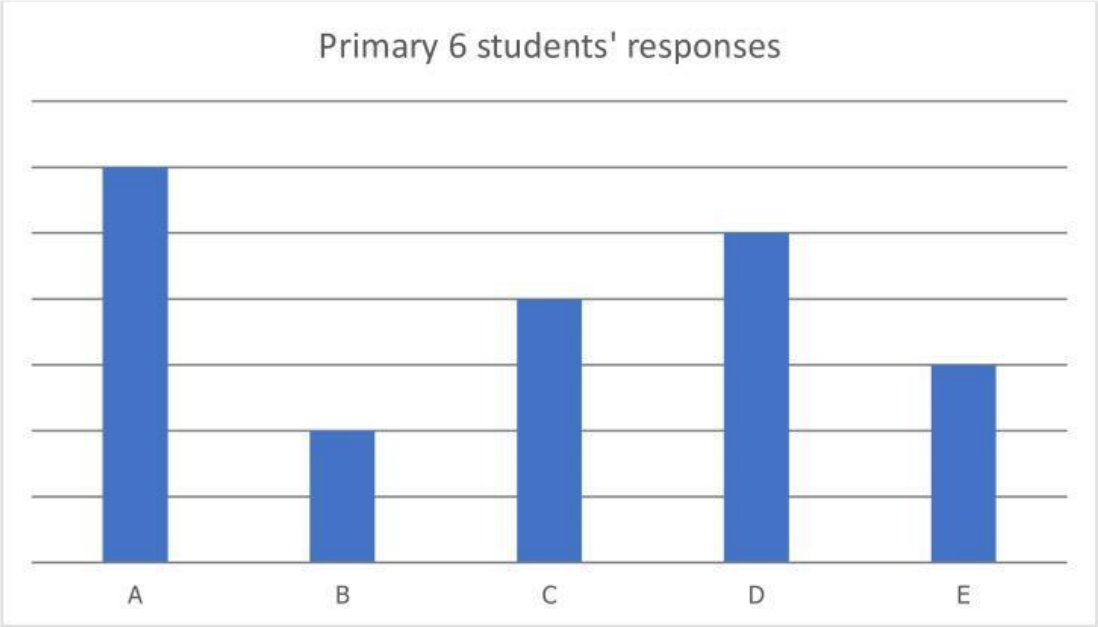
James has tiles of size 3 cm × 7 cm. He wants to put them on the floor of size 23 cm × 10 cm. What is the largest number of tiles that he can put without overlapping or breaking of any tiles?

A. 10
B. 9
C. 8
D. 7
E. None of the above

LIVEWORKSHEETS

Question 6

The following bar chart shows the responses made by SASMO Primary 6 students in a multiple-choice question. All the horizontal lines are equally spaced. Each student selected one of the possible choices and the correct answer is C. Find the percentage of students who answered this question correctly.



A. 25%
B. 16%
C. 24%
D. 20%
E. None of the above

Question 7

Working alone, Ryan can dig a 5 m by 5 m by 5 m hole in six hours. Castel can dig a 10 m by 10 m by 5 m hole in twelve hours. How many hours would it take them to dig a 5 m by 5 m by 5 m hole if they worked together?

A. 4
B. 1
C. 2
D. 3
E. None of the above

LIVEWORKSHEETS

Question 8

The five-digit number A549B is divisible by 45. Find the value of A + B.

A. 0

B. 9

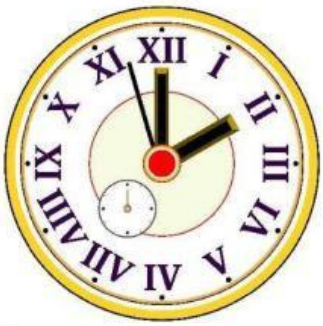
C. 18

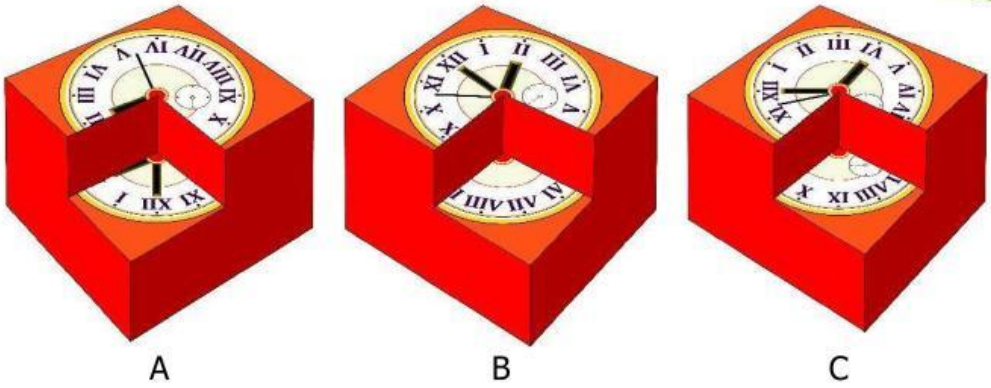
D. 27

E. None of the above

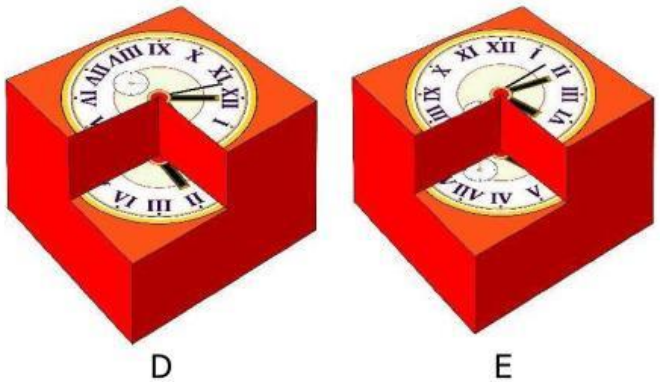
Question 9

Which cube below has a top view same as the clock on the right?





A B C



D E

LIVEWORKSHEETS

Question 10

Stacy bought a pack of M&M chips. After she ate some, the ratio of the number of chips she ate to the number of remaining chips in the pack was 3 : 5. If she eats 50 chips more, then the new ratio will be 7 : 5. How many M&M chips were there in the pack when Stacy bought it?

A. 10
B. 150
C. 240
D. 140
E. None of the above

Question 11

The minute hand of a certain clock is 3 times as long as the hour hand. In 24 hours, the tips of hour and minute hands travelled $1036 \times \pi$ cm in total. How long is the hour hand of the clock? (Use $\pi = \frac{22}{7}$)

A. 7 cm
B. 21 cm
C. 14 cm
D. 7.5 cm
E. None of the above

LIVEWORKSHEETS

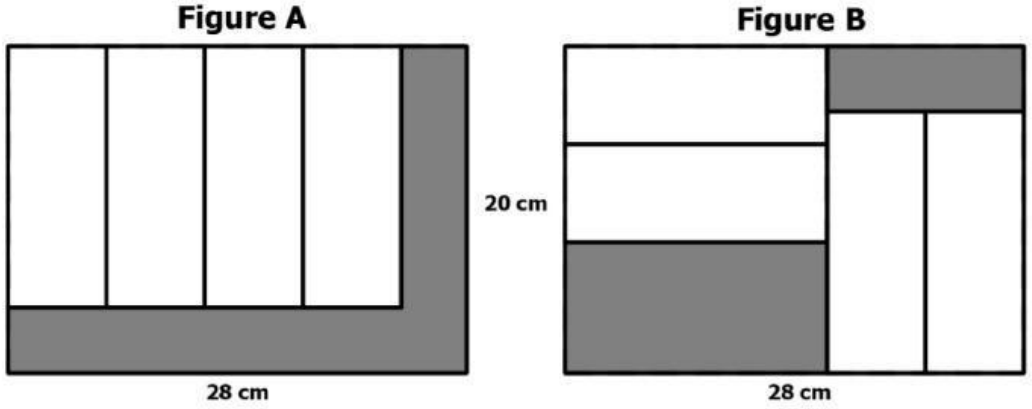
Question 12

In Mathematics, the product of the first n positive integers is written as $n! = n \times (n-1) \times \ldots \times 1$. For example, $2! = 2 \times 1$ and $7! = 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1$. How many consecutive digit "0"s at the end of $8! + 9!$ are there?

A. 0
B. 2
C. 1
D. 3
E. None of the above

Question 13

Four identical rectangles are placed side by side on a 28 cm by 20 cm rectangular piece of paper in 2 different ways as shown in Figures A and B. What is the difference in the perimeters of the shaded regions of Figure A and B?



A. 96 cm
B. 80 cm
C. 32 cm
D. 16 cm
E. None of the above

LIVEWORKSHEETS

Question 14

Hailey, Lydia, Julia, Asher and Charles are Primary 4 or 6 students. They study in either Bright Primary School or Light Primary School.

- Lydia and Charles are from the same grade.
- Julia and Asher study at different levels.
- Three students study in Primary 4 and the other two students in Primary 6.
- Asher and Charles are from different schools.
- Hailey and Julia go to the same school.
- Three students go to Bright Primary School and the other two are from Light Primary School.

If one of them is Primary 6 student from Light Primary School, who is that person?

A. Hailey
B. Lydia
C. Julia
D. Asher
E. Charles

Question 15

In which of the following times is the hour hand closest to the minute hand of a clock?

A. 9:47
B. 9:48
C. 9:49
D. 9:50
E. 9:51

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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

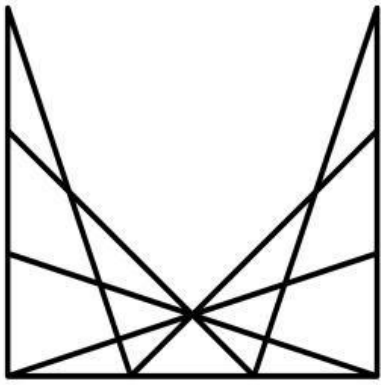
Question 16

Find the last digit of the following product.

$$\underbrace{2 \times 2 \times \ldots \times 2}_{20\ times} \times \underbrace{3 \times 3 \ldots \times 3}_{24\ times}$$

Question 17

How many triangles are there in the figure below?



LIVEWORKSHEETS

Question 18

Find the value of the following.

$$\left(\frac{1}{20 \times 25} + \frac{1}{25 \times 30} + \frac{1}{30 \times 35} + \cdots \frac{1}{2015 \times 2020}\right) \times 2020$$

Question 19

The number of apples in a basket is $\frac{4}{5}$ of the number of oranges. The ratio of the number of pears to the number of apples is 3 : 8. The rest of the fruits are bananas and 20% of all the fruits in the baskets are oranges. The number of bananas is 48 more than the total number of apples, oranges and pears. How many fruits are there in the basket?

LIVEWORKSHEETS

Question 20

The number of digits used to number the pages of a book is twice the number of pages of the book. If the number of pages of the book is a three-digit number, how many pages does the book have?

Question 21

The diameter of Candle A is longer than that of Candle B. Candle A can burn for 24 hours, while Candle B can burn for 16 hours. Both were lit at the same time and had the same height two hours later. If the original height of Candle A is 168 mm, what is the original height (in mm) of Candle B?

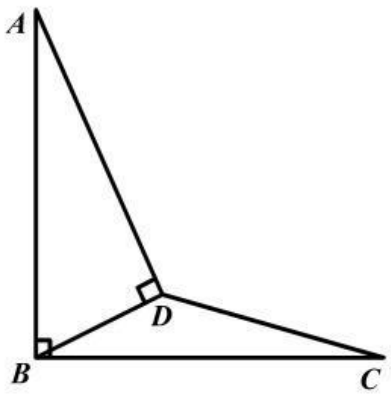
LIVEWORKSHEETS

Question 22

An election for the school president position consists of 4 candidates: Amelia, Brad, Chris and Diana. There are 382 voters. In the middle of the manual count, Amelia got 90 votes, Brad got 45 votes, Chris got 69 votes, and Diana got 78 votes. What is the smallest number of votes that Amelia needs to get in order to ensure that she wins the position?

Question 23

In the diagram, $\angle ABC = \angle ADB = 90°$, $AB = BC$, $BD = 4$ cm and $AD = 6$ cm. Find the area (in cm^2) of triangle BDC.



LIVEWORKSHEETS

Question 24

In the following cryptarithm, all the different letters stand for different digits.

$$\begin{array}{cccccc} & P & Q & R & S \\ \times & & & & 9 \\ \hline & S & R & Q & P \\ \hline \end{array}$$

Find the value of the 4-digit number PQRS.

Question 25

Jason randomly placed digits 1, 2, 3, …, 9 around a circle. When he read three consecutive digits in clockwise order, he got a three-digit whole number. If there are 9 such three-digit numbers, find the sum of the 9 numbers.

END OF PAPER

LIVEWORKSHEETS

Solutions to SASMO 2020 Primary 6 (Grade 6)

Question 1

$$2020 \times 2020 - 2019 \times 2021 = 2020^2 - (2020 - 1) \times (2020 + 1)$$
$$= 2020^2 - 2020^2 + 1 = 1$$

Answer: **(C)**

Question 2

The pattern is as follows:

$$1 + 1 \times 1 = 2$$

$$2 + 2 \times 2 = 6$$

$$6 + 3 \times 3 = 15$$

$$15 + 4 \times 4 = 31$$

$$31 + 5 \times 5 = 56$$

$$56 + 6 \times 6 = \mathbf{92}$$

Answer: **(A)**

Question 3

We can purchase exactly $3 \times 4 = 12$ nuggets, $3 \times 2 + 7 = 13$ nuggets and $7 \times 2 = 14$ nuggets. Next three numbers 15, 16 and 17 can be obtained from 12, 13 and 14 by buying one more pack of 3 nuggets. Thus, all number bigger than 11 can be purchased by buying additional packs of 3 nuggets, and the largest number of chicken nuggets that one cannot purchase is **11**.

Answer: **(E)**

LIVEWORKSHEETS