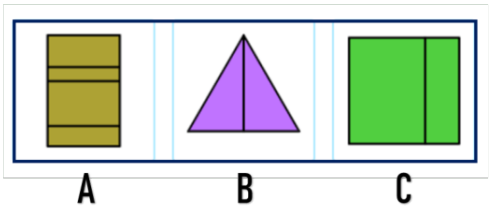
GENIUS CEREBRUM
THE INTELLECTUALS

GC INTERNATIONAL MATHEMATICS OLYMPIAD - LEVEL TWO SAMPLE PAPER

Question 1

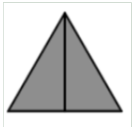
Select the picture that shows equal parts.



Key: B

Solution

This picture shows 2 equal parts:



The remaining pictures do not show equal parts. The parts are not the same size.

Question 2

How do you write this number using digits?

Fifteen thousand one hundred and four.

A. 15140 B. 50410 C. 15104 D. 50104

Key: C

Solution

Use a place value chart:

THOUSANDS	HUNDREDS	TENS	ONES
15	1	0	4

You write fifteen thousand one hundred and four as **15104**

Question 3

When you divide 144 by 9,the result is an even/ odd number?

A B

Key: A

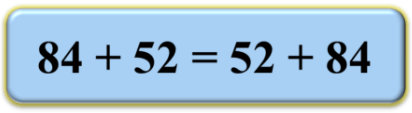
Solution

Result of 144 ÷ 9 is 16

16 is an even number.

Question 4

Identify which property of addition is shown below?



A. Commutative B. Associative C. Identity

Key: A

Solution

Commutative property: j + k = k + j

You can add numbers in any order and get the same sum.

solve

84 + 52 = 52 + 84

This equation shows the commutative property.

Question 5

Yesterday, a shipping company delivered 2467 letters and 3258 parcels. How many items did the company deliver in all?

A. 5705 B. 5725 C. 4735 D. 4075

Key: B

Solution

To know the total number of items delivered by the company add number of letters and parcels delivered.

2467

\+ 3258

5725

Question 6

Complete the pattern

3 + 7 = ☐

30 + 70 = ☐

300 + 700 = ☐

3000 + 7000 = ☐

A. 10, 100, 1000, 10010

B. 10, 100, 1100, 10000

C. 10, 100, 1000, 10000

D. 10, 110, 1000, 10010

Key: C

Solution

Solve the addition to complete the given pattern

3 + 7 = 10

30 + 70 = 100

300 + 700 = 1000

3000 + 7000 = 1000

Question 7

Find the missing digit.

937

\- 6?2

295

A. 6

B. 5

C. 7

D. 4

Key: D

Solution

Start on the right. Subtract the ones column. Look at the tens column. You want to find a number that, when subtracted from 13, gives a difference of 9.

13 − 4 = 9.

The missing number is 4.

Remember to carry over the hundreds.

```
  8 13
  9 3 7
- 6 4 2
  2 9 5
```

Question 8

Estimate the product. Round the first factor to the nearest ten, and then multiply.

81 ×8

The product is approximately ___?

A. 848 B. 648 C. 840 D. 640

Key: D

Solution

Round the first factor to the nearest ten.

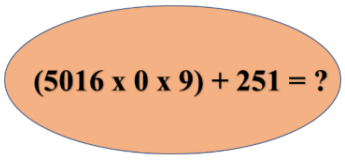
81 x 8 =?

80 x 8 =?

Now multiply:
80 × 8 = 640

The product is approximately 640.

Question 9



A. 251 B. 45395 C. 43287 D. 0

Key: A

Solution

Number multiply by zero is 0

5016 x 0 = 0

0 x 9 = 0

0 + 251 = 251

Answer is 251

Question 10

During the summer, customers buy 478 swim suits from a department store. During the rest of the year, they buy 289. About how many swim suits are sold in all? Choose the better estimate.

A. 800 B. 767 C. 200 D. 189

Key: A

Solution

Add the numbers of swim suits.

478 + 289 =?

Round each number to the nearest hundred.

478 + 289 = ?

500 + 300 = 800

800 is the better estimate.

Question 11

Complete the pattern

☐ ÷ 7 = 1

☐ ÷ 7 = 11

☐ ÷ 7 = 111

☐ ÷ 7 = 1111

A. 7,777,77,7777 B. 77,777,7,7777

C. 777,77,7777,7 D. 7,77,777,7777

Key: D

Solution

1) 7 ones ÷ 7 = 1 ones

7 ÷ 7 = 1

2) 77 ones ÷ 7 = 11 ones

77 ÷ 7 = 11
80 ÷ 4 = 20

3) 777 ones ÷ 7 = 111 ones

777 ÷ 7 = 111

4) 7777 ones ÷ 7 = 1111 ones
7777÷7 = 1111

Question 12

Maddie owns an automobile dealership. Last week, she received a shipment of 159 automobiles. She now has 588 automobiles for sale. How many automobiles did Maddie have before the shipment?

A. 438 B. 459 C. 429 D. 558

Key: C

Solution

Subtract the number of automobiles in the shipment from the number of automobiles for sale.

Subtract:

$$\begin{array}{r} 588 \\ -\ 159 \\ \hline \end{array}$$

The difference is 429.

Maddie had 429 automobiles for sale before the shipment.

Question 13

The Dolphins scored fewer points than the Panthers but more points than the Tigers. Which team scored the most points?

Key: C

Solution

Use the story to put the number of points for each team in order.

The Dolphins scored fewer points than the Panthers.

Fewer Points	More Points
Dolphins	Panthers

The Dolphins scored more points than the Tigers.

Fewer Points		More Points
Tigers	Dolphins	Panthers

The Panthers scored the most points.

Question 14

Type the missing number in this sequence.

A. 25 B. 12 C. 18 D. 15

Key: D

Solution

First, look for a pattern. Each number is 5 times the previous number:

3, _____, 75, 375, 1875, 9375

Multiply 3 by 5 to find the missing number:

$3 \times 5 = 15$

To make the pattern complete, the number 15 must go in the blank space.

Question 15

Tommy is watering the plants one morning. The clock shows as given below

What time is it?

A

B

Key: A

Solution

A.M. means before 12 noon.

P.M. means after 12 noon.

Tommy is watering the plants one morning.

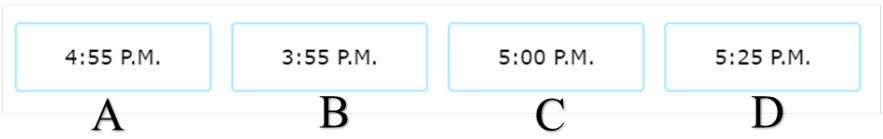
Morning is before 12 noon. It is A.M.

The clock shows:

The time is 8:30 A.M.

Question 16

Kristen and her friends went to a film on Saturday. They left the house at 3:05 P.M. It took 45 minutes to drive to the theatre, and they arrived 1 hour and 5 minutes before the film started. What time did the film start?



A B C D

Key: A

Solution

Add the times to find the total elapsed time.

45 min + 1 h 5 min = 1 h 50 min

Now find 1 hour and 50 minutes after 3:05 P.M.

Add 1 hour to 3:05 P.M. This is 4:05 P.M.

Now add 50 minutes to 4:05 P.M. This is 4:55 P.M.

The film started at 4:55 P.M.

Question 17

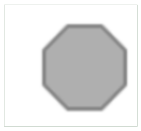
Rob painted a shape that had four sides. Which shape could Rob have painted?

A. Octagon B. Triangle C. Hexagon D. Trapezium

Key: D

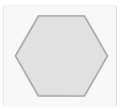
Solution

A. An Octagon has 8 sides



B. A Triangle has 3 sides

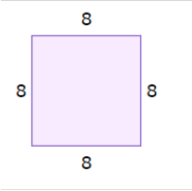
C. A Hexagon has 6 sides



D. A Trapezium had 4 sides

Question 18

A square sticky note has sides that are 8 centimetres long. What is the sticky note's area?



A. 64 cm^2 B. 16 cm^2 C. 8 cm^2 D. 36 cm^2

Key: A

Solution

Area of a square of side A = A^2

Multiply the side length by itself

$8 \times 8 = 64$

The area is 64 square centimetres.

Question 19

What number has 2 tens and no ones?

A. 02 B. 22 C. 12 D. 20

Key: D

Solution

Fill in a place value chart one step at a time.

2 tens

tens	ones
2	?

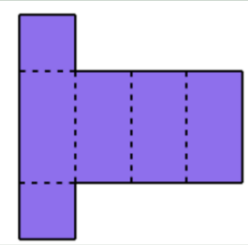
no ones

tens	ones
2	0

The number is 20.

Question 20

Which figure will this net make?

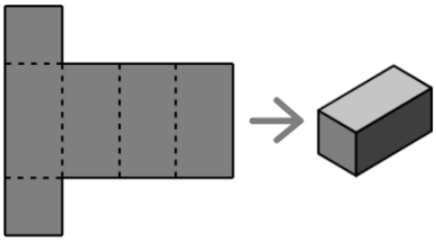


A. rectangular prism
B. pentagonal prism
C. hexagonal prism
D. triangular prism

Key: A

Solution

Imagine folding this net along the dotted lines.



This net makes a rectangular prism.

Question 21

I have a six in the ones place. I am greater than 60 but less than 72.

What number am I?

A. 66
B. 76
C. 06
D. 56

Key: A

Solution

First, start with the descriptions that tell you the highest and lowest possible answers:

"I am greater than 60." and "I am less than 72."

51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80

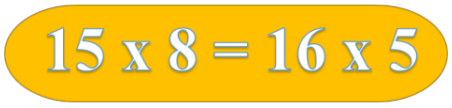
Now find this number:

"I have a six in the ones place."

The number is 66.

Question 22

Is the number sentence true or false?



A. True B. False

Key: B

Solution

A number sentence is true if its two sides are equal.

The number sentence is true because its two sides are equal.

On the left side, 15 × 8 = 120

On the right side, 16 ×5 = 80

15 x 8 is not equal to 16 x 5

So, the answer is false.

Question 23

What is the value of the 8 in the number 712860?

A. 800000 B. 8000 C. 800 D. 80000

Key: C

Solution

Hundred thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
7	1	2	8	6	0

Value of 8 is 8 x 100 = 800

Question 24

Which property of addition is shown?

$$(8 + 5) + 3 = 8 + (5 + 3)$$

A. Associative
B. Commutative
C. Identity
D. Distributive

Key: A

Solution

Associative property:

(b + c) + d = b + (c + d)

You can group the addends with brackets and get the same sum.

(8 + 5) + 3 = 8 + (5 + 3)

This equation shows the associative property.

Question 25

Johnny just started working at a French restaurant. Last week, he polished a combined total of 724 small and large glasses. If Johnny polished 318 small glasses, about how many large glasses did he polish? Choose the better estimate.

A. 506
B. 500
C. 400
D. 382

Key: C

Solution

Subtract the number of small glasses polished from the total number of glasses.
724 – 318 =?

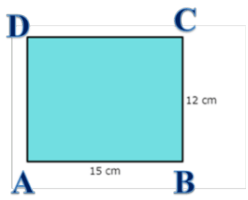
Round each number to the nearest hundred.
724 – 318 =?

700 – 300 = 400

400 is the better estimate.

Question 26

Ria started walking from point A in the path of B, C, D and finally reached to the starting point A. What is the area of the path she walked?



A. 180 sq.cm

B. 190 sq. cm

C. 210 sq. cm

D. 140 sq. cm

Key: A

Solution

Find the base and height of the rectangle.

base: 15 cm

height: 12 cm

Use these numbers in the formula.

Area = base × height

= 15 × 12

= 180

Now find the units. The lengths are measured in centimetres, so the area is measured in square centimetres.

Question 27

Product of the seven multiple of 4 by 6 is _____?

A. 168 B. 24 C. 42 D. 34

Key: A

Solution

Seven multiple of 4 is 28.

Now, 28 x 6 = 168

Question 28

Which of the following will not represent zero?

A. 1 x 0 B. 0 ÷ 2 C. 1 x 1 D. (100 – 100) ÷5

Key: C

Solution

Calculate all the options

A. 1 x 0 = 0

B. 0 ÷ 2 = 0

C. 1 x 1 = 1

D. (100 – 100) ÷5 = 0 ÷ 5 =0

Result of option C is 1 which is not zero.

Question 29

Find the smallest three-digit number which is even and is a multiple of 3 from the following

A. 101 B. 104 C. 109 D. 102

Key: D

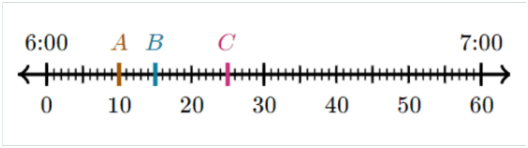
Solution

102 is even and is divisible by 3

102 ÷ 3 = 34

Question 30

The number line below represents one hour on a clock.



Where is 6:25 on the number line?

A. C B. A C. B

Key: A

Solution

Observe the number line.

6:10 is at A

6: 15 is at B

6:25 is at C.

C is at the middle point of 20 and 30

Question 31

$$[(34 \times 12) + 68] - 127 = ?$$

A. 249 B. 359 C. 279 D. 349

Key: D

Solution

Solve the given equation.

34 x 12 = 408

408 + 68 = 476

476 – 127 = **349**

Question 32

Jessica needs stamps for her postcards. Each stamp costs $9. How much will 39 stamps cost?

A. $259 B. $ 359 C. $ 257 D. $351

Key: D

Solution

Each stamp cost is $9

Cost of 39 stamps = 39 x 9

= $ 351

Question 33

What will be the time in the clock after 23 minutes?

A. 1:58 B. 2:57 C. 1:57 D. 2:58

Key: C

Solution

Present time shown in the clock is 1:34

After 23 minutes means 1:34 + 23 minutes = 1:57

Question 34

Is this fraction 7/12?

A. Yes B. No

Key: B

Solution

Number of parts in the given circle = 8

Number of shaded parts = 5

So, the correct fraction for the given picture = 5/8

Question 35

The floor of a room is 8 meter long and 6.5 meter wide. How much carpet is required to cover the room?

A. 11.5 square meters

B. 25 square meters

C. 74.5 square meters

D. 52 square meters

Key: D

Solution

To find the carpet required calculate the area of the room.

Area = length x breadth

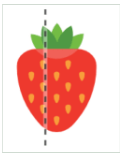
= 8 x 6.5

= 52 square meters

52 square meters of carpet is required to cover the room.

Question 36

Is the dotted line a line of symmetry?



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Key: B

Solution

Imagine folding this picture along the dotted line.

The two sides will not match up. The dotted line is not a line of symmetry.

Question 37

The sum of two numbers is 24. Their quotient is 1. What are the two numbers?

A. 24,12 B. 99,9 C. 9,9 D. 12,12

Key: D

Solution

Think of pairs of numbers whose quotient is 1. Then find the sum of each pair.

Quotient	Sum
24 ÷ 12 = 2	24 + 12 = 36
99 ÷ 9 = 11	99 + 9 = 108
9 ÷ 9 = 1	9 + 9 = 18
12 ÷ 12 = 1	**12 + 12 = 24**

Ans is D

Question 38

A fitness centre has a swimming pool and a gym. There are 3,924 members in the fitness club. There are two kinds of membership: regular and VIP. Each regular member pays $21 per month and each VIP member pays $480 per year. There are 2,915 regular members. What is the membership fees collected per month by the centre from regular members?

A. $62225 B. $71205 C. $61215 D. $74235

Key: C

Solution

2,915 x 21 = 61215

The fitness centre receives $61215 from the regular members.

Question 39

Which inequality does this number line show?

A. less than or equal to 1 B. greater than 1

C. greater than 2 D. greater than or equal to 1

Key: D

Solution

The number line has a filled-in circle on 1. That means the inequality includes the number 1.

The number line also shows an arrow pointing to the right, where numbers are greater than 1. That means the inequality also includes numbers greater than 1.

Together, the circle and arrow show greater than or equal to 1.

Question 40

Choose two numbers to complete the sentence.

[ ] and [ ] have a sum of 131.

A. 29 and 59 B. 43 and 84 C. 72 and 43 D. 59 and 72

Key: D

Solution

Try 59.

What number can you add to 59 to get 131?

59 + 72 = 131

The numbers 59 and 72 have a sum of 131.

Question 41

The Lakewood bakery had 985 bags of sugar. Then an employee used 486 bags of sugar to make some chocolate cake. About how much sugar is left? Choose the better estimate

A. 499 B. 399 C. 500 D. 1471

Key: C

Solution

Subtract the number of bags used to make chocolate cake from the total number of bags.

985 − 486 = ?

Round each number to the nearest hundred.

985 – 486 = ?

1000 – 500 = 500

500 is the better estimate.

Question 42

Each correct answer on a game show is worth 79 points. Last night, a contestant answered 28 questions correctly. About how many points did the contestant earn? Choose the better estimate.

A. 3400 B. 2212 C. 2400 D. 3222

Key: C

Solution

Multiply:
79 x 28 =?

Round each factor to the nearest ten.

79 x 28 =?

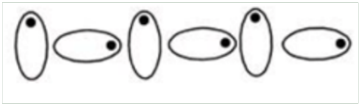
80 x 30 =?

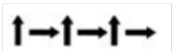
80 x 30 =2400

2400 points are the better estimate.

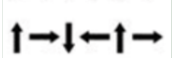
Question 43

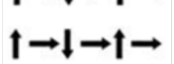
Look at the given pattern of shapes and identify which of these follows the same pattern?



A. 

B. 

C. 

D. 

Key: A

Solution

The pattern in option A follows the same pattern given in the question.

Upwards and right side pattern.

Remaining options follow different patterns.

Question 44

Complete the table.

TOTAL	NUMBER OF EQUAL GROUPS	AMOUNT IN EACH GROUP
55	5	A
84	B	12
108	9	C
135	D	15

A. A=11, B= 7, C= 12, D= 9

B. A=17, B= 7, C= 9, D= 8

C. A=17, B= 8, C= 12, D= 9

D. A=11, B= 4, C= 9, D= 7

Key: A

Solution

1) Look at the first row in the table. Divide:

$55 \div 5 = 11$

The missing number, A is 11.

2) Look at the second row in the table. Divide:
$84 \div 12 = 7$

The missing number, B is 7.

3) Look at the third row in the table. Divide:
$108 \div 12 = 9$

The missing number, C is 12.

4) Look at the last row in the table. Divide:
$135 \div 15 = 9$

The missing number, D is 9.

Question 45

Think of a number. Multiply it by 12. Add 6. Multiply by 3. Subtract 9. Divide by 11. The result is 27. What is the number?

A. 4 B. 40 C. 8 D. 5

Key: C

Solution

Use trial and error method and eliminate the wrong options

Let the number be 8, and follow each of the instructions given in the question.

1) Multiply it by 12

8 x 12 = 96

2) Add 6

96 + 6 = 102

3) Multiply by 3

102 x 3 = 306

4) Subtract 9

306 – 9 = 297

5) Divide by 11

297 ÷ 11 = 27

The result is 27 as given in the question.

So, the number would be 8

Question 46

The canteen wants to buy 533 new forks. If each package contains 5 forks, how many packages should the canteen buy?

A. 108 B. 105 C. 106 D. 107

Key: D

Solution

Divide the number of forks needed by the number of forks in each package.

533 ÷ 5

The quotient is 106 and remainder is 3. To get 533 forks, 106 packages are not sufficient.

107 packages are needed to get required 533 forks.

Question 47

The sum of two numbers is 12. Their quotient is 11. What are the two numbers?

A. 11 and 1 B. 8 and 4 C. 9 and 3 D. 55 and 5

Key: A

Solution

A. Quotient of 11 and 1 = 11

Sum of 11 and 1 = 12

B. Quotient of 8 and 4 = 2

Sum of 8 and 4 = 12

C. Quotient of 9 and 3 = 3

Sum of 9 and 3 = 12

D. Quotient of 55 and 5 = 11

Sum of 55 and 5 = 60

Option A is correct according to the question.

Question 48

Ruth has $22,675. How much money will Ruth have left if she buys a bat signed by a famous baseball player and a CD signed by a famous band?

programme signed by a famous dancer	$3248
bat signed by a famous baseball player	$4015
skate signed by a famous figure skater	$2635
photograph signed by a famous film star	$4402
CD signed by a famous band	$3695
DVD signed by a famous comedian	$2257

A. $14965 B. $13965 C. $14899 D. $12485

Key: A

Solution

Find the total cost of a bat signed by a famous baseball player and a CD signed by a famous band.

4015 + 3695 = 7710

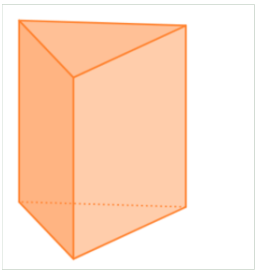
Now subtract the total cost from the starting amount.

22675 – 7710 = 14965

Ruth will have $14965 left.

Question 49

How many faces does this shape have?

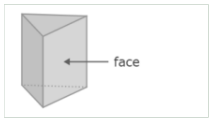


A. 5 B. 6 C. 7 D. 4

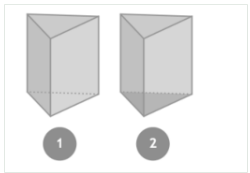
Key: A

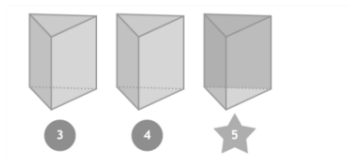
Solution

Faces are the flat parts of the shape.



Count the faces.





The shape has 5 faces.

Question 50

It is now twenty-seven minutes to ten. What time will it be in ten hours and seventeen minutes?

A. 6:50 B. 7:50 C. 6:45 D. 7:55

Key: B

Solution

Twenty-seven minutes to ten means 9:33.

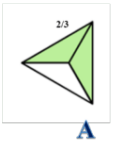
Count by hours to find 10 hours after 9:37. This is 7:33.

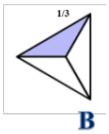
Now add 17 minutes to 7:33. This is 7:50.

It will be 7:50.

Question 51

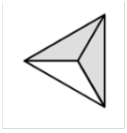
Which fraction is greater?





Key: A

Solution



2/3 because 2 out of 3 equal parts are coloured.

1/3 because 1 out of 3 equal parts is coloured.

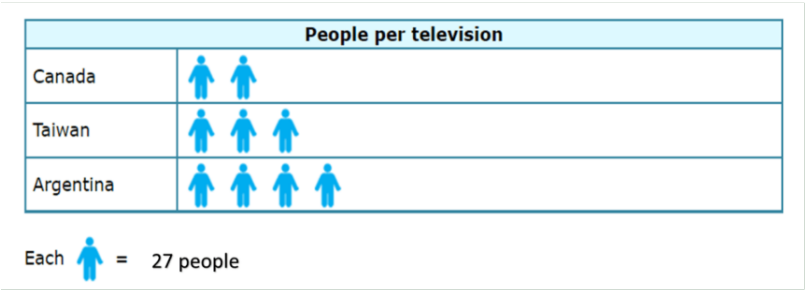
Both shapes have 3 equal parts and are the same size. So, the parts in the first shape are the same size as the parts in the second shape.

When parts are the same size, 2 parts is more than 1 part. So, more of the first shape is coloured.

2/3 is greater than 1/3.

Question 52

Look at this pictograph and find how many people per television are there in Taiwan?



A. 91 B. 108 C. 3 D. 81

Key: D

Solution

Given

In Taiwan it is 

3 x 27 = 81 is the answer.

Question 53

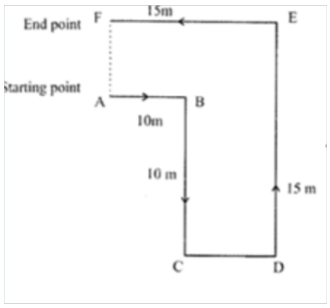
Iera walks 10 meters in front and 10 meters to the right. Then every time turning to her left,she walks 5,15 and 15 meters respectively. How far is she now from her starting point?

A. 10 m B. 25 m C. 15 m D. 5 m

Key: D

Solution

The movement of Iera is shown in the below picture.



A to B, B to C, C to D, D to E and E to F

A is the starting point

F is the ending point

Iera's distance from starting point A to Ending point = AF

= (DE – BC)

= (15 – 10) m = 5 m

Question 54

Identify the relationship between the pair of figures given on either side of ::

Find the missing part.

A. 

B. 

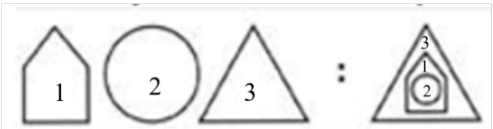
C. 

D. 

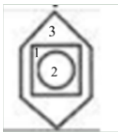
Key: B

Solution

Let's number the given patteern.



The position of shapes follows the pattern 3, 1 and 2.



From the options, Option B follows this pattern.

Question 55

What is the time corresponding to p.m. in the 24-hour clock?

A. 09:00 hours B. 01:00 hours

C. 14:00 hours D. 05:00 hours

Key: C

Solution

In 24 hour clock format,

1:00 p.m is written as 13:00 hours

2: 00 p.m is written as 14:00 hours

Question 56

What will be the successor of X, if X is the sum of 28617 and 32208?

A. 60826 B. 60825 C. 61836 d. 60425

Key: A

Solution

Sum of 28617 and 32208 = 28617 + 32208

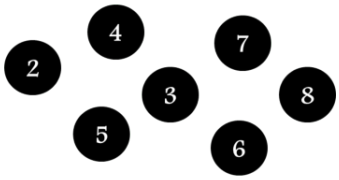
= 60825

Successor of 60825 = 60825 + 1

=60826

Question 57

Which one of the following sets of number are in descending order, if the numbers are formed by using the given digits only?



A. 5687324>5876284>5876324>5876423

B. 7652384>7652834>7625384>7652348

C. 8657324>8657234>8643275>8634275

D. 8657324>8765324>8756324>8756432

Key: C

Solution

Descending order means from highest to lowest number.

The number has to be formed using the given digits.

Only option C follows the descending order.

In option A, 5876284<587632484

In option B, 7652384< 7652834

In option D, 8657324<8765324

Question 58

Maria made one dozen cookies. She gave six of the cookies to her teacher and three of the cookies to her friend. What fraction is equivalent to the amount of cookies Maria gave away?

A. 2/8 B. 3/4 C. 4/9 D. 3/12

Key: B

Solution

Total cookies Maria made = 12

Number of cookies she gave to her teacher and friend = 6 + 3

= 9

Fraction of cookies Maria gave away = 9 / 12

(Both numerator and denominator are divisible by 3)

= 3 / 4

Maria gave **3/4** part of cookies she made.

Question 59

Julie rented a car for $47 a day plus a one-time fee of $54 to fill the gas tank. What is the total amount Julie will owe if she rents the car for 6 days?

A. $606 B. $101 C. $371 D. $336

Key: D

Solution

Rent paid for single day = $ 47

Rent paid for 6 days = 47 x 6 = $ 282

One time fee to fill the gas tank = $ 54

The total amount Julie has to pay = rent + gas charges

= 282 + 54

= $ 336

Question 60

Frank has ⅓ of a book left to read. He decides to complete the book by reading the same amount on each of 2 days. What part of the book should Frank read on each day?

A. 1/6 B. 2/5 C. 3/5 D. 1/2

Key: A

Solution

Part of book left to read = 1/3

To complete the book, Frank reads same amount in two days = (1/3) / 2

= 1/6