aspiration.ai

Scorecard (procreview.jsp?sid=aaaN5tjtX0b7WgArBjowySun Jan 08 23:34:38 IST 2023&qsetId=RN zZHmHFds=&qsetName=)

Accuracy (AccSelectGraph.jsp?sid=aaaN5tjtX0b7WgArBjowySun Jan 08 23:34:38 IST 2023&qsetId=RN zZHmHFds=&qsetName=)

Qs Analysis (QsAnalysis.jsp?sid=aaaN5tjtX0b7WgArBjowySun Jan 08 23:34:38 IST 2023&qsetId=RN zZHmHFds=&qsetName=)

Video Attempt / Solution (VideoAnalysis.jsp?sid=aaaN5tjtX0b7WgArBjowySun Jan 08 23:34:38 IST 2023&qsetId=RN zZHmHFds=&qsetName=)

Solutions (Solution.jsp?sid=aaaN5tjtX0b7WgArBjowySun Jan 08 23:34:38 IST 2023&qsetId=RN zZHmHFds=&qsetName=)

Bookmarks (Bookmarks.jsp?sid=aaaN5tjtX0b7WgArBjowySun Jan 08 23:34:38 IST 2023&qsetId=RN zZHmHFds=&qsetName=)

Section-1

Sec 1

Q.1 [11831809]

A farmer sells one type of rice at Rs. 40 per kg and loses 20% and other type of rice at Rs. 50 per kg and gains 25%. If he mixes the two types in equal proportions and sells the mixture at Rs. 55 per kg, then the profit percentage is

1 ◯ 11.11%

2 ◯ 18.18%

3 ◯ 22.22%

4 ◯ 16.66%

Solution:

Answer key/Solution

Correct Answer : 3

Cost price of first type of rice = 40/0.8 = Rs.50

Cost price of second type of rice = 50/1.25 = Rs.40

Let 1 kg of each type of rice sold.

Then, cost price of 2 kg of rice = 50 + 40 = Rs.90

Selling price of 2 kg rice = 2 × 55 = Rs.110

Hence, required profit percentage = (110 – 90)/90 × 100 = 22.22%.

Bookmark FeedBack

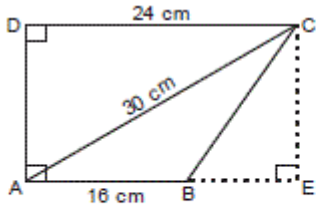
Q.2 [11831809]

In a trapezium ABCD, AB and DC are parallel sides and ∠ADC = 90°. If AB = 16 cm, CD = 24 cm and diagonal AC = 30 cm, then the area (in sq. cm) of the trapezium ABCD is

Solution:

Answer key/Solution

Correct Answer : 360



In triangle ADC, $AD^2 = 30^2 - 24^2 = 324$

$\Rightarrow AD = 18$ cm

So area of trapezium ABCD = Area of rectangle AECD – Area of triangle BEC

$= 18 \times 24 - 1/2 \times 8 \times 18 = 432 - 72 = 360$ sq. cm.

Bookmark FeedBack

Q.3 [11831809]

Let f be a function such that f(x) = f(x – 2) – f(x – 1) where x ≥ 3. If x is a natural number and f(1) = 0, f(2) = 1, then what is the value of f(9)?

Solution:

Answer key/Solution

Correct Answer : -21

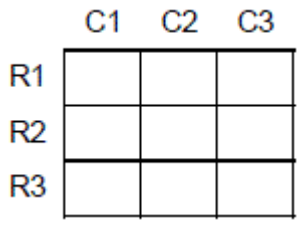
f(1) = 0; f(2) = 1; f(3) = –1; f(4) = 2; f(5) = –3; f(6) = 5; f(7) = –8; f(8) = 13

Hence, f(9) = f(7) – f(8) = – 8 – 13 = –21.

Bookmark FeedBack

Q.4 [11831809]

'0' or '1' is placed in each of the 9 cells of a 3 × 3 grid. Each row and each column have both the digits '0' and '1' in it. If there are either 3 zeros or 3 one's in the grid, then in how many ways can this 3 × 3 grid be filled?



Answer key/Solution

Solution:
Correct Answer : 12
Case (i): 3 zeroes must be in different rows and different columns. First zero can be in any cell in R1. Second zero can be in any cell of R2 except the column already taken. Third zero has only one cell left.
Rest of the cells will have ones. ⇒ Total number of ways = 3 × 2 × 1 = 6
Case (ii): Case of 3 ones is similar to case (i).
Hence, total number of ways = 6 + 6 = 12.

Bookmark FeedBack

Q.5 [11831809]

A car overtakes a bus travelling from Delhi to Jaipur at 7:30 AM. The car reaches Jaipur at 9 AM. After stopping there for 1 hour, it starts back towards Delhi and meets the same bus at 10:30 AM, which was moving towards Jaipur at that time. If both the car and the bus were travelling at uniform speeds on the same route, what will be the time when the bus would reach Jaipur?

1 ◯ 11:00 AM

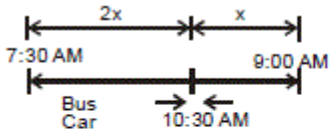
2 ◯ 11:30 AM

3 ◯ 12:00 PM

4 ◯ 12:30 PM

Solution:
Correct Answer : 3

Answer key/Solution



Let the distance at Jaipur from the point the car overlooks the bus, be 3x km. So, the car travels 3x km in 90 minutes. The car starts from Jaipur at 10:00 AM and meets the bus once again in another 30 minutes. The car travelled only x km in 30 minutes. Obviously, the bus travelled only 2x km in 3 hours while the bus met the car again. So, the bus will travel 3x km in 4.5 hours. It will reach Jaipur at 12:00 PM.

Bookmark FeedBack

Q.6 [11831809]

What is the number of zeros at the end of $N = 5^5 \times 10^{10} \times 15^{15} \times \ldots \times 125^{125}$?

1 ◯ 1200

2 ◯ 1520

3 ◯ 2000

4 ◯ 2125

Solution:
Correct Answer : 2
No. of zeros = Highest power of 2, as in this number, highest power of 2 is one less than the highest power of 5.
Lets count the powers of 2 ⇒ 10 + 20 + 30 + … + 120 = 780
Now, the powers of 4 ⇒ 20 + 40 + 60 + … + 120 = 420
Now, the powers of 8 ⇒ 40 + 80 + 120 = 240
Now, the power of 16 ⇒ 80
Hence, highest power of 2 = 1520.

Answer key/Solution

Bookmark FeedBack

Q.7 [11831809]

A group of workers having equal efficiency can complete a job in 5 days. But it so happens that on every alternate day starting from the second day, 3 workers are withdrawn from the job and every alternate day starting from the third day 2 workers are added to the group. If it now takes 8 days to complete the job, find the number of workers who started the job.

1 ◯ 4

2 ◯ 5

3 ◯ 6

4 ◯ 8

Solution:

Answer key/Solution

Correct Answer : 4

Let number of workers who started the job be x.

As efficiency of all are equal, total quantity of work = 5x man-days

Now, in 8 days they are completing the work.

⇒ 5x = x + (x – 3) + (x – 1) + (x – 4) + (x – 2) + (x – 5) + (x – 3) + (x – 6)

⇒ 5x = 8x – 24

⇒ x = 8.

Bookmark FeedBack

Q.8 [11831809]

If the roots of the equation $x^2 + px + q = 0$ are two consecutive multiples of 5, then find the value of $(p^2/4) - q$.

Solution:

Answer key/Solution

Correct Answer : 6.25

If the roots of $x^2 + px + q$ are two consecutive multiples of 5, then their difference is 5.

Now, the roots of the equation $ax^2 + bx + c = 0$ are given by:

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

And the difference of the roots is $\pm\frac{\sqrt{b^2 - 4ac}}{a}$.

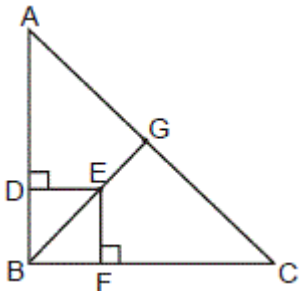
$$\Rightarrow \pm\frac{\sqrt{p^2 - 4q}}{1} = 5 \Rightarrow p^2 - 4q = 4\left(\frac{p^2}{4} - q\right) = 25$$

$$\Rightarrow \left(\frac{p^2}{4} - q\right) = \frac{25}{4} = 6.25.$$

Bookmark FeedBack

Q.9 [11831809]

In the figure given below, triangle ABC is right angled at B, AB = 12 cm, BC = 5 cm and DE = EF. If BE is extended to meet AC at G, then find the length (in cm) of AG.



1 ◯ 55/17

2 ◯ 25/7

3 ◯ 156/17

4 ◯ 65/17

Answer key/Solution

Solution:
Correct Answer : 3
If DE = EF, then BE must be the angular bisector of B.
BE extended meets AC at G.
Using angle bisector theorem :
AG/GC = AB/BC ⇒ AG/GC = 12/5
Using Pythagoras theorem AC = 13 cm
⇒ AG = 12/17 × 13 = 156/17 cm.

Bookmark FeedBack

Q.10 [11831809]

Suraj appeared in six different papers in his semester examination, where the maximum marks were 50 for each paper. His marks in these papers are in the proportion 11 : 10 : 9 : 12 : 13 : 8. Considering his aggregate in all the papers together, he fails to obtain 50% of the total marks. What is the minimum possible additional marks Suraj should get to obtain 50% of the total marks, given that he got integral marks in each paper?

1 ◯ 20

2 ◯ 21

3 ◯ 12

4 ◯ 24

Solution:
Correct Answer : 4

Answer key/Solution

Marks obtained should be less than 50 in all papers put together.
Let us consider the possible cases.
(a) Marks are 11, 10, 9, 12, 13, 8
(b) Marks are 22, 20, 18, 24, 26, 16.
(c) Marks are 33, 30, 27, 36, 39, 24
If we take case(a), the total score is 63 and he requires 87 marks more to get 50% of the total.
If we take case(b), the total score is 126 and he requires 24 marks more to get 50% of the total.
Then, he got more than 50% marks.
In case (c) he already has more than 50% marks. For all other cases his total will be more than 50%.
Hence, the minimum possible additional marks required for him to score at least 50% is 24.

Bookmark FeedBack

Q.11 [11831809]

If $||x - 5| - 3| \geq 1$, find the number of integral values of 'x' which doesn't satisfy the inequality.

1 ◯ 1

2 ◯ 2

3 ◯ 3

4 ◯ 4

Solution:
Correct Answer : 2

Answer key/Solution

$||x-5|-3| \geq 1$

$\Rightarrow |x-5|-3 \geq 1$ or $|x-5|-3 \leq -1$

$\Rightarrow |x-5| \geq 4$ or $|x-5| \leq 2$

Now, for $|x-5| \leq 2$

$\Rightarrow -2 \leq (x-5) \leq 2 \Rightarrow 3 \leq x \leq 7$

For, $|x-5| \geq 4$

$\Rightarrow x \geq 9$ or $x \leq 1$

Values of x for which the inequality holds is $x \leq 1$ and $x \geq 9$ and $3 \leq x \leq 7$

Hence, integer values of x for which the inequality does not hold are 2 and 8 i.e., 2 values.

Bookmark FeedBack

Q.12 [11831809]

There is a sheet of paper. 'P' picks and tears it into 5 pieces. Then 'Q' comes and picks up at least one of the torn pieces and tears each of them into 5 pieces. Similarly, 'R' does the same thing. Which of the following can never be the number of pieces of paper in the end?

1 ◯ 73

2 ◯ 97

3 ◯ 105

4 ◯ 87

Answer key/Solution

Solution:
Correct Answer : 4
Initially there is only one piece of paper. So, at the end of P's action there would be 5 pieces of paper. Q picks up at least 1 piece and can at most pick all the 5 pieces and then tear them.
For every piece of paper that he tears the number of pieces increases by a multiple of 4. Hence, the number of papers at the end of Q's action would be 5 + 4n; where n could be any natural number from 1 to 5.
Hence, the least number would be 9 and the largest number would be 25 with the numbers in between being 13, 17, 21, and 25. Now, R does the same thing.
Hence, at the end of R's action the number of pieces would be (9 + 4n) where n ranges from 1 to 9 (or) (13 + 4n), where n ranges from n = 1 to n = 13 and so on till (25 + 4n) where n = 1 to n = 25.
Ultimately, all the forms (13 + 4n), (17 + 4n), …, (25 + 4n) reduces to nothing but the form (9 + 4n).
Every number from 13 to 125 which are of the form (9 + 4n) could be the number of pieces at the end of R's action.
Now, check the options,
(1) 73 = 9 + 4 × 16
(2) 97 = 9 + 4 × 22
(3) 105 = 9 + 4 × 24
Hence, option (4) is the correct answer.

Bookmark FeedBack

Q.13 [11831809]

A survey was conducted on how many people read books – A, B, C and D – in a group of 1000 people. Results show that 92% of the people surveyed read book A, 89% read book B, 80% read book C, and 72% read book D. What must be the minimum number of people who read all four books, if 20 people do not read any of the four books?

1 ◯ 390

2 ◯ 190

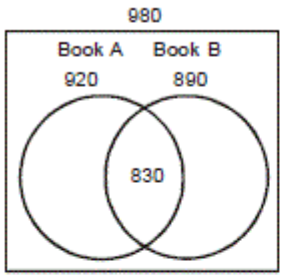
3 ◯ 380

4 ◯ 0

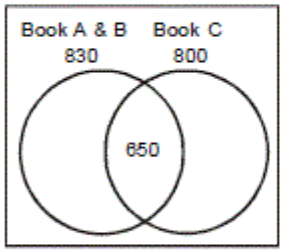
Solution:
Correct Answer : 1

Answer key/Solution

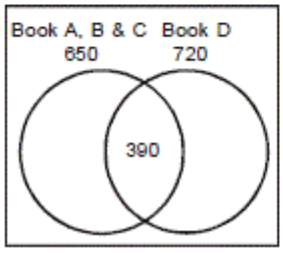
There are 20 people who do not read any of the 4 books. Which means; there are 980 people who read at least 1 of the 4 books.
Suppose all the people (i.e., all 980) read either book A or book B.



⇒ There are a minimum of 830 people who read both book A and B.
Further, 80% people read book C.



At least 650 people are there who read books A, B and C.
Then, 390 people read book D.



Hence, in all, at least 390 people read all 4 books.

Bookmark FeedBack

Q.14 [11831809]
PQ and RS are common tangents to two circles intersecting at A and B. AB, when produced both sides, meet the tangents PQ and RS at X and Y, respectively. If AB = 8 cm, XY = 10 cm, then PQ (in cm) will be

1 ◯ 4

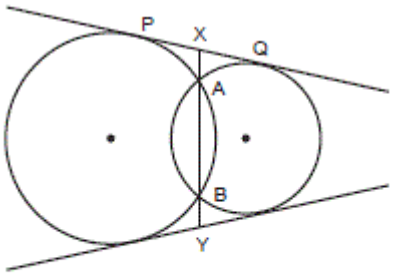
2 ◯ 6

3 ◯ 8

4 ◯ 10

Solution:
Correct Answer : 2

Answer key/Solution



AB = 8 cm and XY = 10 cm
So XA = YB = 1 cm
$PX^2 = XA \times XB = 1 \times 9$
$\Rightarrow PX = 3$ cm = XQ
Hence, PQ = 6 cm.

Bookmark FeedBack

Q.15 [11831809]

Ketan and Jatin start simultaneously from P and reach R via Q along the same road. Ketan travels at 24 km/h from P to Q and at 30 km/h from Q to R. Jatin travels at 30 km/h from P to Q and at 24 km/h from Q to R. Ketan reaches R, 15 minutes before Jatin. How much more distance Ketan has traveled at 30 km/h as compared to the distance (in km) traveled at 24 km/h?

1 ◯ 25

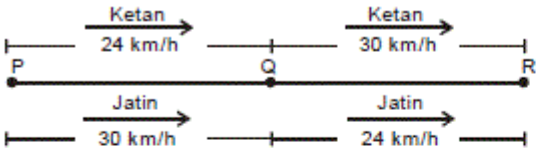
2 ◯ 20

3 ◯ 15

4 ◯ 30

Solution:
Correct Answer : 4

Answer key/Solution



Since Ketan covers the stretch in less time than Jatin, QR > PQ.
Let PQ = x; QR = x + y. T is a point on QR, such that TR = x.

At 24 km/h, it takes 2.5 minutes to cover 1 km.
At 30 km/h, it takes 2 minutes to cover 1 km.
The time taken to cover (PQ + TR) is the same for both Ketan and Jatin. The difference of 15 minutes is created because of the stretch QT. Since Ketan takes 0.5 minutes less to cover every km of stretch QT, Ketan will take 15 minutes less than Jatin to cover 30 km.
Hence, QT = y = 30 km.

Bookmark FeedBack

Q.16 [11831809]

The sequence $a_1, a_2, a_3, \ldots, a_{71}$ satisfied the condition $a_{n+1} = a_n + 2$ for n = 1, 2, 3, ..., 70. If the sum of all the terms a_1 through a_{71} is 2130, find the sum of all terms of the form a_{2n} in this series, where n is a natural number.

1 ◯ 1110

2 ◯ 1050

3 ◯ 960

4 ◯ 1015

Solution:
Correct Answer : 2

Answer key/Solution

This is nothing but an arithmetic progression with a common difference of 2.
Sum to 71 terms = 71 × middle term.
So middle term = 36th term = 2130/71 = 30
So, $a_1 + 35(2) = 30 \Rightarrow a_1 = -40$
and, $a_{71} = -40 + 70 \times 2 = 100$
Hence, required sum = $\Sigma a_{2n} = a_2 + a_4 + \ldots + a_{70} = (-38 + 98)/2 \times 35 = 1050$.

Bookmark FeedBack

Q.17 [11831809]

A solid sphere is cut into 16 identical pieces with 5 cuts. What is the percentage increase in the combined total surface area of all the pieces over that of the original sphere?

1 ◯ 350%

2 ◯ 150%

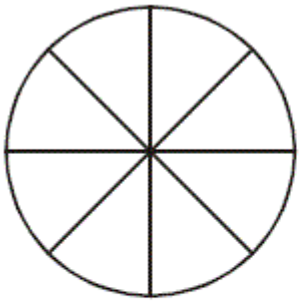
3 ◯ 200%

4 ◯ 250%

Solution:
Correct Answer : 4

Answer key/Solution

With 5 cuts we can cut the sphere into 16 identical pieces.



The above figure gives the top view after 4 cuts that are perpendicular to the equatorial plane of the sphere. And the 5th cut will be along the equilateral plane and it doubles the above eight pieces in number. It can also be noted that each cut passes through the sphere completely. Each such cut would produce two circular plane surfaces with each of the surface equal to the equatorial circle. Let 'r' be the radius of the sphere.
So, five cuts will produce an extra area = $5 \times (2\pi r^2) = 10\pi r^2$.

Hence, increase in area = $\frac{10\pi r^2}{4\pi r^2}$ = 250%.

Bookmark FeedBack

Q.18 [11831809]
The roots of the equation $x^2 - 6x + k = 0$ are p and q such that p > q and the difference of squares of the roots is 24, then find the value of 2k.

Solution:
Correct Answer : 10

Answer key/Solution

Given (p + q) = 6 and pq = k
We know that (p – q) = √(discriminant)/[coefficient of x^2] = √(36 – 4k)
Given $p^2 - q^2 = 24$
⇒ (p + q) (p – q) = 24
⇒ 6 x √(36 – 4k) = 24
⇒ (36 – 4k) = 16 ⇒ 2k = 10.

Bookmark FeedBack

Q.19 [11831809]

From a vessel completely filled up with pure milk, 140 liters is removed and replaced with equal quantity of water. The process is repeated one more time. In a 98 liters sample of the resulting solution 80 liters is water. Find the capacity of the vessel (in liters).

Solution:
Correct Answer : 245

Answer key/Solution

Let x be the volume of the vessel. y liters of milk is removed twice. The % milk left is $x\left(1-\frac{y}{x}\right)^2$

Now, in 98 liters of sample 18 liters is milk which is same as 18/98 part of the solution

$$\left(1-\frac{y}{x}\right)^2=\frac{(x-y)^2}{x^2}=\frac{18}{98}=\frac{9}{49}$$

Let $x^2 = 49K^2$ and $(x-y)^2 = 9K^2$
$\therefore x = 7K$ and $(x-y) = 3K$
$\Rightarrow y = 4K$
Given that $y = 4K = 140$

Hence, $x = 7K = \frac{140}{4}\times 7 = 245$ liters.

Bookmark FeedBack

Q.20 [11831809]

The ratio of compound interest and simple interest on a certain sum is 11 : 10 after two years. What is the common rate of interest (in percentage) per year?

Solution:
Correct Answer : 20

Answer key/Solution

Let compound interest and simple interest be 11x and 10x.
So interest on the interest in the second year is x.
For one year, SI = CI = 5x
Hence, rate percentage = x/5x × 100 = 20%.

Bookmark FeedBack

Q.21 [11831809]

There are 2n integers [0, 0, 1, 1, 2, 2 ,..., (n – 1), (n – 1)]. From these 2n integers, n integers are chosen such that their average is an integer. Find the minimum average of those chosen n integers, given that n = 19.

1 ◯ 4

2 ◯ 5

3 ◯ 6

4 ◯ 7

Answer key/Solution

Solution:
Correct Answer : 2
The minimum average will be obtained when we try to take the smallest numbers.
If we take all the numbers from 1 to 8 (repeated twice), the sum of these 16 numbers = 72.
The nearest multiple of 19 is 95.
95 – 72 = 23 = 11 + 12 + 0
Therefore, it is possible to obtain the sum of 95 using 19 numbers.
Hence, minimum average will be = 95/19 = 5.

Bookmark FeedBack

Q.22 [11831809]

Murphy had Rs. 62 with which he could buy 5 apples, 6 bananas and 7 oranges. Cost of 20 apples, 20 bananas and 20 oranges together are Rs. 220. If he wanted to buy 7 apples, 6 bananas and 5 oranges. How much more money (in Rs.) will he require?

Answer key/Solution

Solution:
Correct Answer : 8
20A + 20B + 20R = 220
∴ A + B + R = 11
Also, 5A + 6B + 7R = 62 … (i)
But he wants (7A + 6B + 5R)
⇒ (12A + 12B + 12R) = 12 × 11 = 132 … (ii)
Subtracting (i) from (ii), we get 7A + 6B + 5R = 70
Hence, he requires Rs. 8 more.

Bookmark FeedBack