

- ALL
- 13
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19. Section E

Complete the blanks in the following question with the appropriate answer.

How many ways can six people of different heights stand in line such that for all $1 \leq k \leq 6$, the k -th tallest person must stand next to either the $(k + 1)$ th or $(k - 1)$ th tallest person (or both)?

In particular, the tallest person must stand next to the second tallest person, and the shortest person must stand next to the second shortest person.

Submit Answer & Continue

Solve question 19



ALL



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18. Section E

Complete the blanks in the following question with the appropriate answer.

A fair six-sided die is rolled repeatedly, and a running total of the dice rolls obtained thus far is kept. For example, if rolls are 2, 3, 1, 1, and 6 in that order, then the running total is 2, 5, 6, 7, then 13.

If the die is rolled indefinitely, then the probability that the running total equals 7 at some point in time is $\frac{p}{q}$, where p and q are positive integers having no common divisors other than 1.

What is the remainder when $(p + q)$ is divided by 1000 ?

Submit Answer & Continue

Solve question 18





17. Section E

ALL



Complete the blanks in the following question with the appropriate answer.

A four-digit positive integer is called *asuboptimal* if the sum of two of its digits equals the sum of the other two digits. For instance, 1234, 2020, and 9801 are all asuboptimal.

How many four-digit positive integers are asuboptimal?

Submit Answer & Continue

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Solve question 17



ALL



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16. Section D

Complete the blanks in the following question with the appropriate answer.

A large number of children sit in a circle. They count the numbers $1, 2, 3, \dots$ in clockwise order, starting with the oldest child who counts the number '1'.

Once any child counts a number which is not divisible by $2, 3$, or 5 , that child leaves the circle and the next child continues with the next number. In particular, the oldest child leaves the circle after counting the number '1'.

They count until only one child remains, at which point they stop counting. Given that the number '121' was the last number counted, how many children were originally in the circle?

Submit Answer & Continue

Solve question 17

- ALL
- 13
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- 17
- 18

15. Section D

Complete the blanks in the following question with the appropriate answer.

Let $f^1(x) = x^2 - 20$ for all real numbers x , and let $f^k(x) = f^1(f^{k-1}(x))$ for all integers $k \geq 2$. Let x_0 and x_1 be the smallest and largest real solutions to the equation $f^{2020}(x) = 0$, respectively.

What is the largest integer less than or equal to $x_0^2 + x_1^2$?

Submit Answer & Continue

Solve question 16



14. Section D

Complete the blanks in the following question with the appropriate answer.

For positive real number t , a t -minute phone call costs $(t^2 - 3t + 4.41)$ rupees.

The minimum cost of a series of phone calls that total to 17 minutes is expressed as $\frac{p}{q}$ rupees, where p and q are positive integers having no common divisors other than 1.

What is the value of $(p + q)$?

Submit Answer & Continue

Solve question 15





ALL



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13. Section D

Complete the blanks in the following question with the appropriate answer.

Let S be a subset of positive integers with the following properties:

- (i) the numbers $1, 2, 3, 4, 5, 6$ are elements of S ; and
- (ii) for all distinct elements a and b in S , $(a \times b)$ is also in S .

Let K be the sum of the reciprocals of all the elements of S .

The minimum possible value of K is $\frac{p}{q}$, where p and q are positive integers, having no common divisors other than 1.

What the value of $(p + q)$?

Submit Answer & Continue



20. Section E

ALL



Complete the blanks in the following question with the appropriate answer.

Let N be the number of integer sequences a_1, a_2, \dots, a_{10} such that for every pair (i, j) , where $1 \leq i < j \leq 10$,

$$|a_i + a_{i+1} + \dots + a_j| \leq 2.$$

What is the remainder when N is divided by 100 ?

Submit Answer & Continue

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[Solve question 20](#)



- ALL
- 6
- 9
- 10
- 11
- 12
- 13

9. Section C

Complete the blanks in the following question with the appropriate answer.

Let $\lfloor x \rfloor$ denote the greatest integer less than or equal to x .

What is the sum of the squares of the real numbers x for which $x^2 - 20\lfloor x \rfloor + 19 = 0$?

Submit Answer & Continue



ALL



6



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8. Section B

Complete the blanks in the following question with the appropriate answer.

How many orderings of the six numbers 1, 1, 2, 2, 3, and 6 are there such that the sum of the first three numbers is twice the sum of the last three numbers?

Submit Answer & Continue



6. Section B

Complete the blanks in the following question with the appropriate answer.

Abhinav has 8 blue balls, 14 red balls, and X yellow balls. Keeping his eyes closed, he chooses 3 balls without replacement.

The probability that he chooses 3 red balls is $\frac{1}{9}$.

What is X?

Submit Answer & Continue



ALL



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7. Section B

Complete the blanks in the following question with the appropriate answer.

Let $a_0, a_2, \dots, a_{2019}$ be real numbers such that $a_0 = 0$ and $a_n + \frac{1}{a_{n+1}} = 2$ for every integer $n \geq 0$.

What is the value of the product $2020 \times a_1 \times a_2 \times \dots \times a_{2019}$?

Submit Answer & Continue



ALL



✓

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✓

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5. Section B

Complete the blanks in the following question with the appropriate answer.

There are 3 indistinguishable bronze keys, 2 indistinguishable silver keys, and 1 gold key.

How many different ways can these keys be laid in a row from left to right, if

1. the gold key cannot be next to a silver key and
2. the order of the keys matters?

Submit Answer & Continue

ENG
IN12:37
16-10-2022



ALL



2

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4. Section A

Complete the blanks in the following question with the appropriate answer.

Kiran wants to go from corner A to corner B of an open field.

If he walks, he can reach the other corner in 10 minutes. If he runs, his average speed increases by 9 km per hour (compared to his walking speed) and he can now reach the other corner in 4 minutes.

What is the distance in kilometers from corner A to corner B?

Submit Answer & Continue

ENG
IN12:34
16-10-2022



ALL



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1. Section A

Complete the blanks in the following question with the appropriate answer.

Let $f(n) = n^2 + n + 2020$

What is the sum of the **distinct** prime factors of the number $f(2019)$?

40440400

Submit Answer & Continue



- ALL
- 1
- 2
- 3
- 4
- 5
- 6
- 7
- 8

2. Section A

Complete the blanks in the following question with the appropriate answer.

A group of k children are playing with a 52-card deck. The deck is split so that every child receives a different number of cards, and each child receives at least one card.

What is the maximum possible value of k ?

Submit Answer & Continue



ALL



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12. Section C

Complete the blanks in the following question with the appropriate answer.

Positive integers $a, b, c \geq 2$ satisfy the equation $abc + ab + a = 64$.

What is the value of $a + b + c$?

Submit Answer & Continue



ALL



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11. Section C

Complete the blanks in the following question with the appropriate answer.

Shree has ₹372, consisting of two currency notes in each of the denominations ₹1, ₹5, ₹10, ₹20, ₹50, and ₹100. Using any combination of one or more of these notes, how many different monetary amounts can Shree form?

For example, she can form ₹141 using one ₹100 note, two ₹20 notes, and one ₹1 note.

Submit Answer & Continue