CAT 2023 – Quantitative Ability

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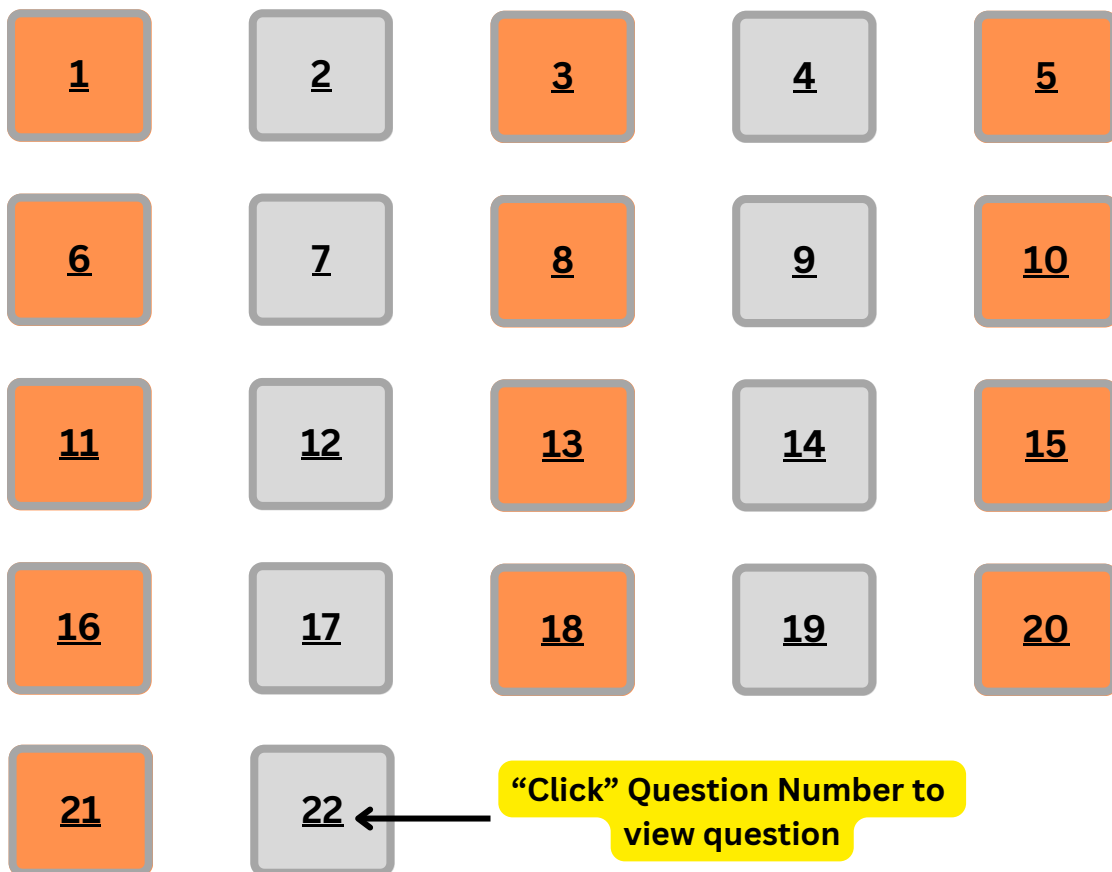
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CAT 2023 – Quantitative Ability

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1	2	3	4	5
6	7	8	9	10
11	12	13	14	15
16	17	18	19	20
21	22			

"Click" Question Number to view question

CAT 2023 Slot - 2 – Quantitative Ability

Let a, b, m and n be natural numbers such that $a > 1$ and $b > 1$. If $a^m b^n = 144^{145}$, then the largest possible value of $n - m$ is

A. 580

B. 290

C. 579

D. 289

Explanation   Video Solution

CAT 2023 Slot - 2 – Quantitative Ability

The sum of all possible values of x satisfying the equation $2^{4x^2} - 2^{2x^2+x+16} + 2^{2x+30} = 0$, is

A. 3/2

B. 5/2

C. 1/2

D. 3

Explanation

Video Solution

CAT 2023 Slot - 2 – Quantitative Ability

For any natural numbers m, n, and k, such that k divides both $m+2n$ and $3m+4n$, k must be a common divisor of

A. $2m$ and $3n$

B. m and $2n$

C. $2m$ and n

D. m and n

Explanation

Video Solution

2IIM

CAT 2023 Slot - 2 – Quantitative Ability

Any non-zero real numbers x, y such that $y \neq 3$ and $\frac{x}{y} < \frac{x+3}{y-3}$, will satisfy the condition

A. $if\, y > 10, then - x > y$

B. $if\, x < 0, then - x > y$

C. $if\, y < 0, then - x > y$

D. $\frac{x}{y} < \frac{y}{x}$

[Explanation]   [Video Solution]

CAT 2023 Slot - 2 – Quantitative Ability

For some positive real number x, if $\log_{\sqrt{3}}(x) + \dfrac{\log_x(25)}{\log_x(0.008)} = \dfrac{16}{3}$, then the value of $\log_3\left(3x^2\right)$ is

<div align="center">

Explanation   **Video Solution**

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2IIM

CAT 2023 Slot - 2 – Quantitative Ability

The number of positive integers less than 50, having exactly two distinct factors other than 1 and itself, is

Explanation

Video Solution

CAT 2023 Slot - 2 – Quantitative Ability

Let k be the largest integer such that the equation $(x - 1)^2 + 2kx + 11 = 0$ has no real roots. If y is a positive real number, then the least possible value of $\frac{k}{4y} + 9y$ is

Explanation

Video Solution

CAT 2023 Slot - 2 – Quantitative Ability

In a company, 20% of the employees work in the manufacturing department. If the total salary obtained by all the manufacturing employees is one-sixth of the total salary obtained by all the employees in the company, then the ratio of the average salary obtained by the manufacturing employees to the average salary obtained by the non-manufacturing employees is

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

Explanation

Video Solution

CAT 2023 Slot - 2 – Quantitative Ability

Minu purchases a pair of sunglasses at Rs.1000 and sells to Kanu at 20% profit. Then, Kanu sells it back to Minu at 20% loss. Finally, Minu sells the same pair of sunglasses to Tanu. If the total profit made by Minu from all her transactions is Rs.500, then the percentage of profit made by Minu when she sold the pair of sunglasses to Tanu is

A. 35.42%
B. 31.25%
C. 52%
D. 26%

Explanation

Video Solution

CAT 2023 Slot - 2 – Quantitative Ability

Pipes A and C are fill pipes while Pipe B is a drain pipe of a tank. Pipe B empties the full tank in one hour less than the time taken by Pipe A to fill the empty tank. When pipes A, B and C are turned on together, the empty tank is filled in two hours. If pipes B and C are turned on together when the tank is empty and Pipe B is turned off after one hour, then Pipe C takes another one hour and 15 minutes to fill the remaining tank. If Pipe A can fill the empty tank in less than five hours, then the time taken, in minutes, by Pipe C to fill the empty tank is

A. 90
B. 60
C. 120
D. 75

Explanation

Video Solution

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CAT 2023 Slot - 2 – Quantitative Ability

Ravi is driving at a speed of 40 km/h on a road. Vijay is 54° meters behind Ravi and driving in the same direction as Ravi. Ashok is driving along the same road from the opposite direction at a speed of 50 km/h and is 225 meters away from Ravi. The speed, in km/h, at which Vijay should drive so that all the three cross each other at the same time, is

A.   58.8
B.   64.4
C.   67.2
D.   61.6

Explanation

Video Solution

CAT 2023 Slot - 2 – Quantitative Ability

Anil borrows Rs 2 lakhs at an interest rate of 8% per annum, compounded half-yearly. He repays Rs 10320 at the end of the first year and closes the loan by paying the outstanding amount at the end of the third year. Then, the total interest, in rupees, paid over the three years is nearest to

A. 45311
B. 51311
C. 33130
D. 40991

Explanation

Video Solution

2IIM

CAT 2023 Slot - 2 – Quantitative Ability

The price of a precious stone is directly proportional to the square of its weight. Sita has a precious stone weighing 18 units. If she breaks it into four pieces with each piece having distinct integer weight, then the difference between the highest and lowest possible values of the total price of the four pieces will be 288000. Then, the price of the original precious stone is

- A. 1296000
- B. 1944000
- C. 972000
- D. 1620000

Explanation

Video Solution

CAT 2023 Slot - 2 – Quantitative Ability

A container has 40 liters of milk. Then, 4 liters are removed from the container and replaced with 4 liters of water. This process of replacing 4 liters of the liquid in the container with an equal volume of water is continued repeatedly. The smallest number of times of doing this process, after which the volume of milk in the container becomes less than that of water, is

Explanation   Video Solution

CAT 2023 Slot - 2 – Quantitative Ability

Jayant bought a certain number of white shirts at the rate of Rs 1000 per piece and a certain number of blue shirts at the rate of Rs 1125 per piece. For each shirt, he then set a fixed market price which was 25% higher than the average cost of all the shirts. He sold all the shirts at a discount of 10% and made a total profit of Rs 51000. If he bought both colors of shirts, then the maximum possible total number of shirts that he could have bought is

<div style="text-align:center">

Explanation   **Video Solution**

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CAT 2023 Slot - 2 – Quantitative Ability

If a certain amount of money is divided equally among n persons, each one receives Rs 352 . However, if two persons receive Rs 506 each and the remaining amount is divided equally among the other persons, each of them receive less than or equal to Rs 330 . Then, the maximum possible value of n is

CAT 2023 Slot - 2 – Quantitative Ability

In a rectangle ABCD, AB = 9 cm and BC = 6 cm. P and Q are two points on BC such that the areas of the figures ABP, APQ, and AQCD are in geometric progression. If the area of the figure AQCD is four times the area of triangle ABP, then BP : PQ : QC is

A. 1 : 1 : 2
B. 1 : 2 : 4
C. 2 : 4 : 1
D. 1 : 2 : 1

[Explanation]   [Video Solution]

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CAT 2023 Slot - 2 – Quantitative Ability

A triangle is drawn with its vertices on the circle C such that one of its sides is a diameter of C and the other two sides have their lengths in the ratio a:b. If the radius of the circle is r, then the area of the triangle is

A. $\dfrac{abr^2}{2\left(a^2 + b^2\right)}$

B. $\dfrac{abr^2}{\left(a^2 + b^2\right)}$

C. $\dfrac{4abr^2}{2\left(a^2 + b^2\right)}$

D. $\dfrac{2abr^2}{2\left(a^2 + b^2\right)}$

Explanation   **Video Solution**

CAT 2023 Slot - 2 – Quantitative Ability

The area of the quadrilateral bounded by the Y-axis, the line $x = 5$, and the lines $|x - y| - |x - 5| = 2$, is

Explanation

Video Solution

CAT 2023 Slot - 2 – Quantitative Ability

Let both the series $a_1, a_2, a_3, \ldots$ and $b_1, b_2, b_3 \ldots$ be in arithmetic progression such that the common differences of both the series are prime numbers. If $a_5 = b_9$, $a_{19} = b_{19}$ and $b_2 = 0$, then a_{11} equals

A. 79

B. 83

C. 86

D. 84

Explanation

Video Solution

CAT 2023 Slot - 2 – Quantitative Ability

If $p^2 + q^2 - 29 = 2pq - 20 = 52 - 2pq$, then the difference between the maximum and minimum possible value of $(p^3 - q^3)$ is

A. 486
B. 189
C. 378
D. 243

Explanation

Video Solution

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CAT 2023 Slot - 2 – Quantitative Ability

Let a_n and b_n be two sequences such that $a_n = 13 + 6(n - 1)$ and $b_n = 15 + 7(n - 1)$ for all natural numbers n. Then, the largest three digit integer that is common to both these sequences, is

Explanation

Video Solution