

CAT 2018 Slot 2 – Quantitative Ability

Number of Questions: 34

Duration: 1 hour

Marking scheme: +3(for correct answer) & -1(for wrong answer)



How to take value from this PDF?

- You can take this as a sectional test. Or you can just solve these questions one-at-a-time regardless of any time limit. Either way, we want you to attempt the question first, before looking at the solution.
- A detailed video-solution has been provided for each question.
- For advice on CAT preparation, various test-taking strategies and MBA in general, click [me](#).

How to use this PDF?

- Click on the blue colored “Answers” tab to see the correct answer to the question.
- The grey colored “Video solutions” tab will re-direct you to a YouTube page where the solution is elaborately discussed.
- Similarly, you can navigate back to the question from the solutions by clicking on the “Back to the Question” tab.
- You can find many CAT level questions from 2IIM’s Question Bank, that too free of cost. Click on questions.2iim.com (present at the bottom of each slide) to know more.

Question 1

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Points A, P, Q and B lie on the same line such that P, Q and B are, respectively, 100 km, 200 km and 300 km away from A. Cars 1 and 2 leave A at the same time and move towards B. Simultaneously, car 3 leaves B and moves towards A. Car 3 meets Car 1 at Q, and Car 2 at P. If each car is moving in uniform speed then the ratio of the speed of Car 2 to that of Car 1 is

Answer

[Click to see the correct answer](#)

Video Solution

[Click to view video Solution
for this question](#)

- A) 1 : 4
- B) 2 : 9
- C) 1 : 2
- D) 2 : 7

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Question 2

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Let $a_1, a_2, a_3, \dots, a_{52}$ be positive integers such that $a_1 < a_2 < \dots < a_{52}$. Suppose, their arithmetic mean is one less than the arithmetic mean of a_2, a_3, \dots, a_{52} . If $a_{52} = 100$, then the largest possible value of a_1 is

- A) 48
- B) 20
- C) 45
- D) 23

Answer

Video Solution

Question 3

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There are two drums, each containing a mixture of paints A and B. In drum 1, A and B are in the ratio 18 : 7. The mixtures from drums 1 and 2 are mixed in the ratio 3 : 4 and in this final mixture, A and B are in the ratio 13 : 7. In drum 2, then A and B were in the ratio

- A) 251 : 163
- B) 239 : 161
- C) 220 : 149
- D) 229 : 141

Answer

Video Solution



Question 4

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On a triangle ABC, a circle with diameter BC is drawn, intersecting AB and AC at points P and Q, respectively. If the lengths of AB, AC, and CP are 30 cm, 25 cm, and 20 cm respectively, then the length of BQ, in cm, is (TITA)

Answer

Video Solution



Question 5

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Let t_1, t_2, \dots be real numbers such that $t_1 + t_2 + \dots + t_n = 2n^2 + 9n + 13$, for every positive integer $n \geq 2$. If $t_k = 103$, then k equals (TITA)

Answer

Video Solution



Question 6

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From a rectangle ABCD of area 768 sq cm, a semicircular part with diameter AB and area 72π sq cm is removed. The perimeter of the leftover portion, in cm, is

- A) $88 + 12\pi$
- B) $80 + 16\pi$
- C) $86 + 8\pi$
- D) $82 + 24\pi$

Answer

Video Solution

Question 7

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If N and x are positive integers such that $N^N = 2^{160}$ and $N^2 + 2^N$ is an integral multiple of 2^x , then the largest possible x is (TITA)

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Answer

Video Solution

Question 8

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A chord of length 5 cm subtends an angle of 60° at the centre of a circle. The length, in cm, of a chord that subtends an angle of 120° at the centre of the same circle is

- A) 2π
- B) $5\sqrt{3}$
- C) $6\sqrt{2}$
- D) 8

Answer

Video Solution

Question 9

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If $p^3 = q^4 = r^5 = s^6$, then the value of $\log_s(pqr)$ is equal to

- A) $\frac{24}{5}$
- B) 1
- C) $\frac{47}{10}$
- D) $\frac{16}{5}$

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Answer

Video Solution

Question 10

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In a tournament, there are 43 junior level and 51 senior level participants. Each pair of juniors play one match. Each pair of seniors play one match. There is no junior versus senior match. The number of girl versus girl matches in junior level is 153, while the number of boy versus boy matches in senior level is 276. The number of matches a boy plays against a girl is (TITA)

Answer

Video Solution



Question 11

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A 20% ethanol solution is mixed with another ethanol solution, say, S of unknown concentration in the proportion 1:3 by volume. This mixture is then mixed with an equal volume of 20% ethanol solution. If the resultant mixture is a 31.25% ethanol solution, then the unknown concentration of S is

- A) 50%
- B) 55%
- C) 48%
- D) 52%

Answer

Video Solution



Question 12

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The area of a rectangle and the square of its perimeter are in the ratio 1 : 25. Then the lengths of the shorter and longer sides of the rectangle are in the ratio:

- A) 3 : 8
- B) 2 : 9
- C) 1 : 4
- D) 1 : 3

Answer

Video Solution

Question 13

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The smallest integer n for which $4^n > 17^{19}$ holds, is closest to

- A) 33
- B) 39
- C) 37
- D) 35

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Answer

Video Solution



Question 14

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The smallest integer n such that $n^3 - 11n^2 + 32n - 28 > 0$ is (TITA)

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Answer

Video Solution



Question 15

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A parallelogram ABCD has area 48 sqcm. If the length of CD is 8 cm and that of AD is s cm, then which one of the following is necessarily true?

- A) $s \geq 6$
- B) $s \neq 6$
- C) $5 \leq s \leq 7$
- D) $s \leq 6$

Answer

Video Solution

Question 16

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The value of the sum $7 \times 11 + 11 \times 15 + 15 \times 19 + \dots + 95 \times 99$ is

- A) 80707
- B) 80751
- C) 80730
- D) 80773

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Answer

Video Solution

Question 17

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On a long stretch of east-west road, A and B are two points such that B is 350 km west of A. One car starts from A and another from B at the same time. If they move towards each other, then they meet after 1 hour. If they both move towards east, then they meet in 7 hrs. The difference between their speeds, in km per hour, is (TITA)

Answer

Video Solution



Question 18

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If the sum of squares of two numbers is 97, then which one of the following cannot be their product?

- A) 64
- B) -32
- C) 16
- D) 48

Answer

Video Solution



Question 19

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A jar contains a mixture of 175 ml water and 700 ml alcohol. Gopal takes out 10% of the mixture and substitutes it by water of the same amount. The process is repeated once again. The percentage of water in the mixture is now

- A) 25.4
- B) 20.5
- C) 30.3
- D) 35.2

Answer

Video Solution



Question 20

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Points A and B are 150 km apart. Cars 1 and 2 travel from A to B, but car 2 starts from A when car 1 is already 20 km away from A. Each car travels at a speed of 100 kmph for the first 50 km, at 50 kmph for the next 50 km, and at 25 kmph for the last 50 km. The distance, in km, between car 2 and B when car 1 reaches B is (TITA)

Answer

Video Solution



Question 21

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A tank is emptied everyday at a fixed time point. Immediately thereafter, either pump A or pump B or both start working until the tank is full. On Monday, A alone completed filling the tank at 8 pm. On Tuesday, B alone completed filling the tank at 6 pm. On Wednesday, A alone worked till 5 pm, and then B worked alone from 5 pm to 7 pm, to fill the tank. At what time was the tank filled on Thursday if both pumps were used simultaneously all along?

- A) 4 : 12 PM
- B) 4 : 24 PM
- C) 4 : 48 PM
- D) 4 : 36 PM

Answer

Video Solution

Question 22

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Ramesh and Ganesh can together complete a work in 16 days. After seven days of working together, Ramesh got sick and his efficiency fell by 30%. As a result, they completed the work in 17 days instead of 16 days. If Ganesh had worked alone after Ramesh got sick, in how many days would he have completed the remaining work?

- A) 12
- B) 14.5
- C) 13.5
- D) 11

Answer

Video Solution

Question 23

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If a and b are integers such that $2x^2 - ax + 2 > 0$ and $x^2 - bx + 8 \geq 0$ for all real numbers x , then the largest possible value of $2a - 6b$ is (TITA)

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Answer

Video Solution

Question 24

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The scores of Amal and Bimal in an examination are in the ratio 11 : 14. After an appeal, their scores increase by the same amount and their new scores are in the ratio 47 : 56. The ratio of Bimal's new score to that of his original score is

- A) 3 : 2
- B) 4 : 3
- C) 5 : 4
- D) 8 : 5

Answer

Video Solution

Question 25

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A triangle ABC has area 32 sq units and its side BC, of length 8 units, lies on the line $x = 4$. Then the shortest possible distance between A and the point (0,0) is

- A) $4\sqrt{2}$ units
- B) $2\sqrt{2}$ units
- C) 4 units
- D) 8 units

Answer

Video Solution



Question 26

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How many two-digit numbers, with a non-zero digit in the units place, are there which are more than thrice the number formed by interchanging the positions of its digits?

- A) 5
- B) 8
- C) 7
- D) 6

Answer

Video Solution

Question 27

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A water tank has inlets of two types A and B. All inlets of type A when open, bring in water at the same rate. All inlets of type B, when open, bring in water at the same rate. The empty tank is completely filled in 30 minutes if 10 inlets of type A and 45 inlets of type B are open, and in 1 hour if 8 inlets of type A and 18 inlets of type B are open. In how many minutes will the empty tank get completely filled if 7 inlets of type A and 27 inlets of type B are open? (TITA)

Answer

Video Solution



Question 28

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Gopal borrows Rs. X from Ankit at 8% annual interest. He then adds Rs. Y of his own money and lends Rs. $X+Y$ to Ishan at 10% annual interest. At the end of the year, after returning Ankit's dues, the net interest retained by Gopal is the same as that accrued to Ankit. On the other hand, had Gopal lent Rs. $X+2Y$ to Ishan at 10%, then the net interest retained by him would have increased by Rs. 150. If all interests are compounded annually, then find the value of $X + Y$.
(TITA)

Answer

Video Solution



Question 29

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The arithmetic mean of x , y and z is 80, and that of x , y , z , u and v is 75, where $u = (x+y)/2$ and $v = (y+z)/2$. If $x \geq z$, then the minimum possible value of x is (TITA)

Answer

Video Solution



Question 30

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Let $f(x) = \max\{5x, 52 - 2x^2\}$, where x is any positive real number. Then the minimum possible value of $f(x)$ is (TITA)

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Answer

Video Solution

Question 31

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For two sets A and B, let $A\Delta B$ denote the set of elements which belong to A or B but not both. If $P = \{1,2,3,4\}$, $Q = \{2,3,5,6\}$, $R = \{1,3,7,8,9\}$, $S = \{2,4,9,10\}$, then the number of elements in $(P\Delta Q)\Delta(R\Delta S)$ is

- A) 7
- B) 8
- C) 9
- D) 6

Answer

Video Solution

Question 32

If $A = \{62n - 35n - 1 : n = 1, 2, 3, \dots\}$ and $B = \{35(n-1) : n = 1, 2, 3, \dots\}$ then which of the following is true?

- A) Neither every member of A is in B nor every member of B is in A
- B) Every member of A is in B and at least one member of B is not in A
- C) Every member of B is in A.
- D) At least one member of A is not in B

Answer

Video Solution

Question 33

The strength of a salt solution is $p\%$ if 100 ml of the solution contains p grams of salt. If three salt solutions A, B, C are mixed in the proportion $1 : 2 : 3$, then the resulting solution has strength 20% . If instead the proportion is $3 : 2 : 1$, then the resulting solution has strength 30% . A fourth solution, D, is produced by mixing B and C in the ratio $2 : 7$. The ratio of the strength of D to that of A is

- A) $3 : 10$
- B) $1 : 3$
- C) $2 : 5$
- D) $1 : 4$

Answer

Video Solution

Question 34

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$$\frac{1}{\log_2 100} - \frac{1}{\log_4 100} + \frac{1}{\log_5 100} - \frac{1}{\log_{10} 100} + \frac{1}{\log_{20} 100} \\ - \frac{1}{\log_{25} 100} + \frac{1}{\log_{50} 100}$$

Answer

Video Solution

- A) 0
- B) $\frac{1}{2}$
- C) -4
- D) 10

Done with the Questions! Take a break 😊

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- Practice, practice and then practice some more. 2IIM's Question bank is generally a must-solve on all serious CAT aspirants' checklist. Click [this](#) to check it out!

Solutions

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- 1) Option A 11) Option A 21) Option B 31) Option A
2) Option D 12) Option C 22) Option C 32) Option B
3) Option B 13) Option B 23) 36 33) Option B
4) 24 14) 8 24) Option B 34) Option B
5) 24 15) Option A 25) Option C
6) Option A 16) Option A 26) Option D
7) 10 17) 50 27) 48
8) Option B 18) Option A 28) 4000
9) Option C 19) Option D 29) 105
10) 1098 20) 5 30) Option A

Sol 1

Click to see "overall Solution page"

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Points A, P, Q and B lie on the same line such that P, Q and B are, respectively, 100 km, 200 km and 300 km away from A. Cars 1 and 2 leave A at the same time and move towards B. Simultaneously, car 3 leaves B and moves towards A. Car 3 meets Car 1 at Q, and Car 2 at P. If each car is moving in uniform speed then the ratio of the speed of Car 2 to that of Car 1 is

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Video Solution

- A) 1 : 4
- B) 2 : 9
- C) 1 : 2
- D) 2 : 7

Sol 2

Let $a_1, a_2, a_3, \dots, a_{52}$ be positive integers such that $a_1 < a_2 < \dots < a_{52}$. Suppose, their arithmetic mean is one less than the arithmetic mean of a_2, a_3, \dots, a_{52} . If $a_{52} = 100$, then the largest possible value of a_1 is

- A) 48
- B) 20
- C) 45
- D) 23

Sol 3

There are two drums, each containing a mixture of paints A and B. In drum 1, A and B are in the ratio 18 : 7. The mixtures from drums 1 and 2 are mixed in the ratio 3 : 4 and in this final mixture, A and B are in the ratio 13 : 7. In drum 2, then A and B were in the ratio

- A) 251 : 163
- B) 239 : 161**
- C) 220 : 149
- D) 229 : 141

Sol 4

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On a triangle ABC, a circle with diameter BC is drawn, intersecting AB and AC at points P and Q, respectively. If the lengths of AB, AC, and CP are 30 cm, 25 cm, and 20 cm respectively, then the length of BQ, in cm, is (TITA)

Answer: **24**

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Sol 5

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Let t_1, t_2, \dots be real numbers such that $t_1 + t_2 + \dots + t_n = 2n^2 + 9n + 13$, for every positive integer $n \geq 2$. If $t_k = 103$, then k equals (TITA)

Answer: **24**

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Sol 6

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From a rectangle ABCD of area 768 sq cm, a semicircular part with diameter AB and area 72π sq cm is removed. The perimeter of the leftover portion, in cm, is

- A) $88 + 12\pi$
- B) $80 + 16\pi$
- C) $86 + 8\pi$
- D) $82 + 24\pi$

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Video Solution

Sol 7

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If N and x are positive integers such that $N^N = 2^{160}$ and $N^2 + 2^N$ is an integral multiple of 2^x , then the largest possible x is (TITA)

Answer: **10**

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Sol 8

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A chord of length 5 cm subtends an angle of 60° at the centre of a circle. The length, in cm, of a chord that subtends an angle of 120° at the centre of the same circle is

- A) 2π
- B) $5\sqrt{3}$**
- C) $6\sqrt{2}$
- D) 8

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Sol 9

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If $p^3 = q^4 = r^5 = s^6$, then the value of $\log_s(pqr)$ is equal to

- A) $\frac{24}{5}$
- B) 1
- C) $\frac{47}{10}$**
- D) $\frac{16}{5}$

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Sol 10

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In a tournament, there are 43 junior level and 51 senior level participants. Each pair of juniors play one match. Each pair of seniors play one match. There is no junior versus senior match. The number of girl versus girl matches in junior level is 153, while the number of boy versus boy matches in senior level is 276. The number of matches a boy plays against a girl is (TITA)

Answer: **1098**

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Sol 11

A 20% ethanol solution is mixed with another ethanol solution, say, S of unknown concentration in the proportion 1:3 by volume. This mixture is then mixed with an equal volume of 20% ethanol solution. If the resultant mixture is a 31.25% ethanol solution, then the unknown concentration of S is

- A) 50%**
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Sol 12

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The area of a rectangle and the square of its perimeter are in the ratio 1 : 25.
Then the lengths of the shorter and longer sides of the rectangle are in the ratio:

- A) 3 : 8
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Sol 13

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The smallest integer n for which $4^n > 17^{19}$ holds, is closest to

- A) 33
- B) 39**
- C) 37
- D) 35

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Sol 14

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The smallest integer n such that $n^3 - 11n^2 + 32n - 28 > 0$ is (TITA)

Answer: **8**

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Sol 15

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A parallelogram ABCD has area 48 sqcm. If the length of CD is 8 cm and that of AD is s cm, then which one of the following is necessarily true?

- A) $s \geq 6$
- B) $s \neq 6$
- C) $5 \leq s \leq 7$
- D) $s \leq 6$

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Sol 16

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The value of the sum $7 \times 11 + 11 \times 15 + 15 \times 19 + \dots + 95 \times 99$ is

- A) **80707**
- B) 80751
- C) 80730
- D) 80773

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Sol 17

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On a long stretch of east-west road, A and B are two points such that B is 350 km west of A. One car starts from A and another from B at the same time. If they move towards each other, then they meet after 1 hour. If they both move towards east, then they meet in 7 hrs. The difference between their speeds, in km per hour, is (TITA)

Answer: **50**

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Sol 18

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If the sum of squares of two numbers is 97, then which one of the following cannot be their product?

- A) 64
- B) -32
- C) 16
- D) 48

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Sol 19

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A jar contains a mixture of 175 ml water and 700 ml alcohol. Gopal takes out 10% of the mixture and substitutes it by water of the same amount. The process is repeated once again. The percentage of water in the mixture is now

- A) 25.4
- B) 20.5
- C) 30.3
- D) 35.2**

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Sol 20

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Points A and B are 150 km apart. Cars 1 and 2 travel from A to B, but car 2 starts from A when car 1 is already 20 km away from A. Each car travels at a speed of 100 kmph for the first 50 km, at 50 kmph for the next 50 km, and at 25 kmph for the last 50 km. The distance, in km, between car 2 and B when car 1 reaches B is (TITA)

Answer: **5**

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Video Solution



Sol 21

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A tank is emptied everyday at a fixed time point. Immediately thereafter, either pump A or pump B or both start working until the tank is full. On Monday, A alone completed filling the tank at 8 pm. On Tuesday, B alone completed filling the tank at 6 pm. On Wednesday, A alone worked till 5 pm, and then B worked alone from 5 pm to 7 pm, to fill the tank. At what time was the tank filled on Thursday if both pumps were used simultaneously all along?

- A) 4 : 12 PM
- B) 4 : 24 PM**
- C) 4 : 48 PM
- D) 4 : 36 PM

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Sol 22

Ramesh and Ganesh can together complete a work in 16 days. After seven days of working together, Ramesh got sick and his efficiency fell by 30%. As a result, they completed the work in 17 days instead of 16 days. If Ganesh had worked alone after Ramesh got sick, in how many days would he have completed the remaining work?

- A) 12
- B) 14.5
- C) 13.5**
- D) 11

Sol 23

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If a and b are integers such that $2x^2 - ax + 2 > 0$ and $x^2 - bx + 8 \geq 0$ for all real numbers x , then the largest possible value of $2a - 6b$ is (TITA)

Answer: **36**

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Sol 24

The scores of Amal and Bimal in an examination are in the ratio 11 : 14. After an appeal, their scores increase by the same amount and their new scores are in the ratio 47 : 56. The ratio of Bimal's new score to that of his original score is

- A) 3 : 2
- B) 4 : 3**
- C) 5 : 4
- D) 8 : 5

Sol 25

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A triangle ABC has area 32 sq units and its side BC, of length 8 units, lies on the line $x = 4$. Then the shortest possible distance between A and the point (0,0) is

- A) $4\sqrt{2}$ units
- B) $2\sqrt{2}$ units
- C) 4 units**
- D) 8 units

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Sol 26

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How many two-digit numbers, with a non-zero digit in the units place, are there which are more than thrice the number formed by interchanging the positions of its digits?

- A) 5
- B) 8
- C) 7
- D) 6**

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Sol 27

A water tank has inlets of two types A and B. All inlets of type A when open, bring in water at the same rate. All inlets of type B, when open, bring in water at the same rate. The empty tank is completely filled in 30 minutes if 10 inlets of type A and 45 inlets of type B are open, and in 1 hour if 8 inlets of type A and 18 inlets of type B are open. In how many minutes will the empty tank get completely filled if 7 inlets of type A and 27 inlets of type B are open? (TITA)

Answer: **48**

Sol 28

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Gopal borrows Rs. X from Ankit at 8% annual interest. He then adds Rs. Y of his own money and lends Rs. $X+Y$ to Ishan at 10% annual interest. At the end of the year, after returning Ankit's dues, the net interest retained by Gopal is the same as that accrued to Ankit. On the other hand, had Gopal lent Rs. $X+2Y$ to Ishan at 10%, then the net interest retained by him would have increased by Rs. 150. If all interests are compounded annually, then find the value of $X + Y$. (TITA)

Answer: 4000

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Video Solution



Sol 29

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The arithmetic mean of x , y and z is 80, and that of x , y , z , u and v is 75, where $u = (x+y)/2$ and $v = (y+z)/2$. If $x \geq z$, then the minimum possible value of x is (TITA)

Answer: **105**

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Video Solution



Sol 30

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Let $f(x) = \max\{5x, 52 - 2x^2\}$, where x is any positive real number. Then the minimum possible value of $f(x)$ is (TITA)

Answer: **-65/2**

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Sol 31

For two sets A and B, let $A\Delta B$ denote the set of elements which belong to A or B but not both. If $P = \{1,2,3,4\}$, $Q = \{2,3,5,6\}$, $R = \{1,3,7,8,9\}$, $S = \{2,4,9,10\}$, then the number of elements in $(P\Delta Q)\Delta(R\Delta S)$ is

- A) 7
- B) 8
- C) 9
- D) 6

Sol 32

If $A = \{62n - 35n - 1 : n = 1, 2, 3, \dots\}$ and $B = \{35(n-1) : n = 1, 2, 3, \dots\}$ then which of the following is true?

- A) Neither every member of A is in B nor every member of B is in A
- B) Every member of A is in B and at least one member of B is not in A**
- C) Every member of B is in A.
- D) At least one member of A is not in B

Sol 33

The strength of a salt solution is $p\%$ if 100 ml of the solution contains p grams of salt. If three salt solutions A, B, C are mixed in the proportion 1 : 2 : 3, then the resulting solution has strength 20%. If instead the proportion is 3 : 2 : 1, then the resulting solution has strength 30%. A fourth solution, D, is produced by mixing B and C in the ratio 2 : 7. The ratio of the strength of D to that of A is

- A) 3 : 10
- B) 1 : 3**
- C) 2 : 5
- D) 1 : 4

Sol 34

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$$\frac{1}{\log_2 100} - \frac{1}{\log_4 100} + \frac{1}{\log_5 100} - \frac{1}{\log_{10} 100} + \frac{1}{\log_{20} 100} - \frac{1}{\log_{25} 100} + \frac{1}{\log_{50} 100}$$

- A) 0
- B) $\frac{1}{2}$**
- C) -4
- D) 10

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