

Suppose a, b, c, \dots, x, y, z are 26 natural numbers in GP such that $a = 2$ and the common ratio = 2. What is the value of $\log_a b \times \log_b c \times \log_c d \times \dots \times \log_x y \times \log_y z$?

Enter your response (as an integer) using the virtual keyboard in the box provided below.



Congratulations, you solved the question correctly and took less than average time!

Explanation:

$$\log_a b \times \log_b c \times \log_c d \times \dots \times \log_x y \times \log_y z = \frac{\log b}{\log a} \times \frac{\log c}{\log b} \times \frac{\log d}{\log c} \times \dots \times \frac{\log y}{\log x} \times \frac{\log z}{\log y} = \frac{\log z}{\log a} = \log_a z$$

Now, $a = 2$, $b = 2^2$, $c = 2^3$, ..., $y = 2^{25}$, $z = 2^{26}$

Therefore, $\log_a z = \log_2 2^{26} = 26$

Therefore, the required answer is 26.

Correct Answer:

Time taken by you: **67 secs**

Avg Time taken by all students: **97 secs**

Your Attempt: **Correct**

% Students got it correct: **65 %**

If $a_1 = 2$ and $a_n - a_{n-1} = (n - 1)$; for every natural number $n > 1$; find the value of $(a_1 + a_2 + \dots + a_{100})$.

Enter your response (as an integer) using the virtual keyboard in the box provided below.

Explanation:

$$S_i = 1 + 2 + \dots + n$$

$$a_1 + a_2 + \dots + a_{100}$$

$$= a_1 + (a_1 + S_1) + \dots (a_1 + S_{99})$$

$$= 100a_1 + (S_1 + S_2 + \dots + S_{99})$$

$$= 100a_1 + \sum_{n=1}^{99} \frac{n(n+1)}{2}$$

$$= 100a_1 + \sum_{n=1}^{99} \frac{n^2}{2} + \sum_{n=1}^{99} \frac{n}{2}$$

$$= 100a_1 + \frac{1}{2} \times \frac{99 \times 100 \times 199}{6} + \frac{1}{2} \times \frac{99 \times 100}{2}$$

$$= 100 \times 2 + 33 \times 25 \times 199 + 25 \times 99$$

$$= 166850$$

Therefore, the required answer is 166850.

Correct Answer:

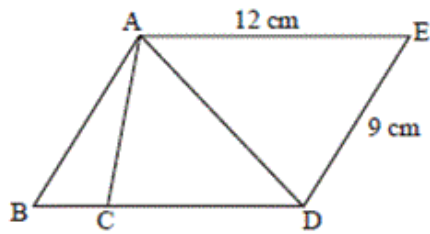
Time taken by you: 133 secs

Avg Time taken by all students: 33 secs

Your Attempt: Skipped

% Students got it correct: 11 %

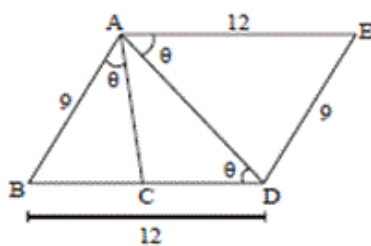
▭ABDE is a parallelogram. Also, $\angle CAB \cong \angle ADB$. Find CD.



- ☒ 6.75 cm ❌
- ☐ 5.25 cm
- ☐ 10 cm
- ☐ 9.67 cm

😞 Oops, you got it wrong!

Explanation:



In $\triangle ABC$ and $\triangle DBA$

$$\angle CAB \cong \angle ADB$$

$$\angle ABC \cong \angle DBA$$

$$\therefore \triangle ABC \sim \triangle DBA \quad (\text{by AA test})$$

$$\frac{AB}{DB} = \frac{BC}{BA} \Rightarrow \frac{9}{12} = \frac{BC}{9} \Rightarrow BC = \frac{81}{12}$$

$$\therefore CD = DB - BC = 12 - \frac{81}{12} = 5.25 \text{ cm}$$

Hence, [2].

Correct Answer:

Time taken by you: 55 secs

Avg Time taken by all students: 130 secs

Your Attempt: Wrong

% Students got it correct: 59 %

If $x^2 + 9y^2 + x - 6y = -\frac{5}{4}$, then find the value of $(3y - 4x)$.

Enter your response (as an integer) using the virtual keyboard in the box provided below.



Oops, you got it wrong!



Explanation:



$$x^2 + 9y^2 + x - 6y = -\frac{5}{4}$$

$$\Rightarrow x^2 + x + 9y^2 - 6y = -\frac{5}{4}$$

$$\Rightarrow \left(x^2 + x + \frac{1}{4}\right) + (9y^2 - 6y + 1) - 1 - \frac{1}{4} = -\frac{5}{4}$$

$$\Rightarrow \left(x + \frac{1}{2}\right)^2 + (3y - 1)^2 = 0$$

Since a perfect square cannot be negative, both the given terms must individually be 0.

$$\text{So } x = -\frac{1}{2} \text{ and } y = \frac{1}{3}$$

$$\text{Therefore, } 3y - 4x = 3\left(\frac{1}{3}\right) - 4\left(-\frac{1}{2}\right) = 1 + 2 = 3$$

Therefore, the required answer is 3.

Correct Answer:



Time taken by you: **105 secs**

Avg Time taken by all students: **96 secs**

Your Attempt: **Wrong**

% Students got it correct: **53 %**

A tank has a number of inlet and outlet pipes attached to it. All inlet pipes are identical. Similarly all outlet pipes are also identical. If one inlet and one outlet pipes are operated, the tank, which is initially completely empty, is completely filled in 72 hours. If one inlet and two outlet pipes are operated, the tank, which is initially full, is completely emptied in 36 hours. If three inlet pipes and four outlet pipes are operated on the tank, which is initially completely full, in how many hours will the tank be completely emptied?

- ☐ 24 hours
- ☐ 36 hours
- ☐ 48 hours
- ☒ The tank will never be emptied ✓



Congratulations, you solved the question correctly and took less than average time!



Explanation:



LCM of 72 and 36 is 72. Therefore, let the volume of the tank = 72 litres.

Effective volume inlet by one inlet and one outlet pipe = $\frac{72}{72} = 1$ litre/hour.

Effective volume taken out by one inlet and two outlet pipes = $\frac{72}{36} = 2$ litres/hour.

If each inlet pipe takes in 'x' litres per hour and each outlet pipe takes out 'y' litres per hour, we get the following:

$$x - y = 1$$

$$x - 2y = -2$$

Solving these two equations, we get $x = 4$ and $y = 3$.

If 3 inlet pipes and 4 outlet pipes are used, the rate of change of liquid per hour = $3(4) + 4(-3) = 0$.

Therefore, there will be no change in the volume of the liquid in the tank. Therefore, the tank will never be emptied.

Hence, [4].

Correct Answer:



Time taken by you: 5 secs

Avg Time taken by all students: 192 secs

Your Attempt: Correct

% Students got it correct: 75 %



Three vessels A, B and C of capacity 120 litres each contain a mixture of alcohol and spirit. Vessel A contains 100 litres of the mixture with 65% alcohol. Vessel B has 70% alcohol and this vessel is half empty. The vessel C has 80 litres of mixture out of which 20 litres is spirit. Now, the mixture from vessel A is poured into vessel B until vessel B is completely filled. Then the mixture from vessel B is poured into vessel C until C is completely filled. Now the entire mixture from vessel C is poured into the vessels A and B in the ratio 2 : 1. Find the ratio of alcohol in vessels A and B.

☐ $\frac{9}{10}$

☐ $\frac{41}{42}$

☐ $\frac{84}{83}$

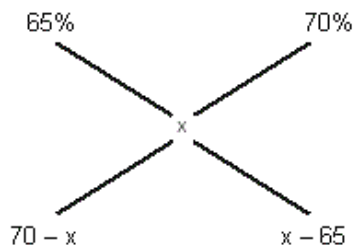
☐ $\frac{28}{27}$

Explanation:

Initially the vessels A, B and C contain mixture and alcohol as given below:

	A	B	C
Alcohol	65%	70%	75%
Mixture	100 litre	60 litre	80 litre

To make vessel B full, 60 litres of mixture from vessel A should be poured into B.
Let the new mixture in B contain $x\%$ alcohol, then



$$\Rightarrow \frac{1}{1} = \frac{x - 65}{70 - x} \Rightarrow x = 67.5\%$$

Now, the new mixture in B is poured in vessel C, then



Correct Answer:

Time taken by you: 14 secs

Avg Time taken by all students: 311 secs

Your Attempt: Skipped

% Students got it correct: 72 %

A man's wealth was distributed between his son, daughter and wife in the ratio 2 : 3 : 5. He had a plot of land, a house and Rs.1 lakh. The son got two-thirds of the land, the daughter got the house and the wife got the remaining land and Rs. 1 lakh. What is the value of the land and house, respectively?

- ☐ Rs. 60,000 & Rs. 90,000
- ☒ Rs. 75,000 each ✓
- ☐ Rs. 75,000 & Rs. 1,12,500
- ☐ Data insufficient



Congratulations, you solved the question correctly and took less than average time!

Explanation:



Let their shares be $2x$, $3x$ and $5x$.

$\frac{2}{3}$ of the land is $2x$.

Then, the remaining part of the land i.e., $\frac{1}{3}$ of the land = x .

Hence, from the wife's share, Rs. 1 lakh = $4x$.

$\therefore x = \text{Rs. } 25,000$

The value of the land and the house = $3x$ each, i.e., Rs. 75,000 each.

Hence, [2].

Correct Answer:



Time taken by you: **85 secs**

Avg Time taken by all students: **196 secs**

Your Attempt: **Correct**

% Students got it correct: **80 %**



In the figure shown, square II is formed by joining the midpoints of the sides of square I. Square III is formed in a similar manner from square II and this process is continued. The sum of the area of all the squares so formed will be:

(Assume that the area of square I is A sq. units)

- ☐ A sq. units
- ☒ 2A sq. units ✓
- ☐ 4A sq. units
- ☐ 8A sq. units



Congratulations, you solved the question correctly and took less than average time!

Explanation:

If 'a' is the side of square I, length of diagonal of square II = a

Therefore side of square II = $\frac{a}{\sqrt{2}}$

Similarly side of square III = $\frac{a}{2}$... and so on.

Area of square II = $\frac{A}{2}$, Area of square III = $\frac{A}{4}$... and so on.

\therefore The required sum = $A + \frac{A}{2} + \frac{A}{4} + \frac{A}{8} + \dots = A(1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \dots) = \frac{A \times 1}{1 - \frac{1}{2}} = 2A$ sq. units

Hence, [2].

Correct Answer:

Time taken by you: **48 secs**

Avg Time taken by all students: **129 secs**

Your Attempt: **Correct**

% Students got it correct: **81 %**

Consider quarter circles drawn in the first and third quadrants with origin as the centre and radius = 17 units. The number of the points with integer coordinates within the two quarter circles and on the boundaries is:

- ☐ 577
- ☐ 343
- ☐ 424
- ☐ 485

Explanation:

The equation of the quarter in the first quadrant is $x^2 + y^2 = 289$, $x \geq 0$, $y \geq 0$.

The equation of the quarter in the third quadrant is $x^2 + y^2 = 289$, $x \leq 0$, $y \leq 0$.

Origin is common to both the quarter circles.

The following are the points in the first quadrant and its boundaries satisfying $x^2 + y^2 \leq 289$.

1. (0, 1), (0, 2), (0, 3), ..., (0, 17) (17 points)
2. (1, 0), (1, 1), (1, 2), (1, 3), ..., (1, 16) (17 points)
3. (2, 0), (2, 1), (2, 2), (2, 3), ..., (2, 16) (17 points)
4. (3, 0), (3, 1), (3, 2), ..., (3, 16) (17 points)
5. (4, 0), (4, 1), (4, 2), ..., (4, 16) (17 points)
6. (5, 0), (5, 1), (5, 2), ..., (5, 16) (17 points)
7. (6, 0), (6, 1), (6, 2), ..., (6, 15) (16 points)
8. (7, 0), (7, 1), (7, 2), ..., (7, 15) (16 points)
9. (8, 0), (8, 1), (8, 2), ..., (8, 15) (16 points)
10. (9, 0), (9, 1), (9, 2), ..., (9, 14) (15 points)

Correct Answer:

Time taken by you: **41 secs**

Avg Time taken by all students: **61 secs**

Your Attempt: **Skipped**

% Students got it correct: **25 %**

K, M and N enter into a partnership. K contributes a sum for 6 months and claims $\left(\frac{1}{8}\right)^{\text{th}}$ of the profits. M's contribution is for 4 months and N contributes Rs. 3,200 for 11 months and claims two-thirds of the profit. What is M's contribution?

Enter your response (as an integer) using the virtual keyboard in the box provided below.

Rs.



Oops, you got it wrong!

Question 13

Wrong Answer

Wrong Answer

Wrong Answer

Wrong Answer

Wrong Answer

Wrong Answer

Wrong Answer

Wrong Answer

Explanation:

Let K's capital be Rs. x and M's capital be Rs. y.

∴ $6x : 4y : 3200 \times 11$ is the compounded ratio of the capital and period of investments.

∴ M's ratio of profit = $1 - \left(\frac{1}{8} + \frac{2}{3}\right) = \frac{5}{24}$

∴ Ratio of profits is $\frac{3}{24} : \frac{5}{24} : \frac{16}{24}$ i.e., 3 : 5 : 16

∴ $\frac{35200}{16} = \frac{6x}{3} = \frac{4y}{5}$

∴ y = Rs. 2,750

Therefore, the required answer is 2750.

Correct Answer:

Time taken by you: 113 secs

Avg Time taken by all students: 113 secs

Your Attempt: **Wrong**

% Students got it correct: 51 %

$\triangle ABC$ is drawn such that AB is tangent to a circle with radius 3 cm at A and BC passes through the centre of the circle. Point C lies on the circle. If $\ell(BC) = 8$ cm, then find the area of $\triangle ABC$.

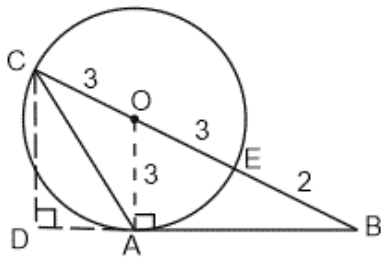
- ☐ 15.36 cm²
- ☐ 8.4 cm²
- ☒ 12.8 cm² ✖
- ☐ 9.6 cm²



Oops, you got it wrong!

Explanation:

Let O be the centre of the circle and $CD \perp AB$.



$$\therefore \ell(BC) = 8 \text{ cm}, \ell(BE) = 8 - 6 = 2 \text{ cm}$$

$$\Rightarrow \ell(AB) = \sqrt{5^2 - 3^2} = 4 \text{ cm}$$

Now, $\triangle BAO \sim \triangle BDC$

$$\therefore \frac{\ell(AO)}{\ell(DG)} = \frac{\ell(BO)}{\ell(BG)} \Rightarrow \frac{3}{\ell(DG)} = \frac{5}{8}$$

$$\Rightarrow \ell(\text{DC}) = 4.8 \text{ cm}$$

Correct Answer:

Time taken by you: 167 secs

Avg Time taken by all students: 98 secs

Your Attempt: Wrong

% Students got it correct: 38 %

A man hired 72 people to complete a piece of work in N days. But after 15 days, he found that only 30% of the work was completed. So he hired 48 more people. Consequently, the work was completed on time. What is the value of N ?

Enter your response (as an integer) using the virtual keyboard in the box provided below.



Oops, you got it wrong!

01:52

Explanation:

The work done by 72 people in 15 days is $72 \times 15 = 1080$ man-days. Now this is 30% of the total work; so the total work must be $1080 \times \frac{100}{30} = 3600$ man-days. The balance $3600 - 1080 = 2520$ man-days is done by $72 + 48 = 120$ people; this will take = 21 days more. The total time for the work will therefore be $21 + 15 = 36$ days.

Therefore, the required answer is 36.

Correct Answer:

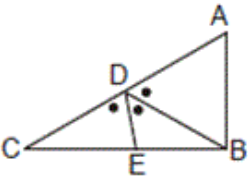
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Time taken by you: 282 secs

Avg Time taken by all students: 94 secs

Your Attempt: Wrong

% Students got it correct: 47 %



Find DE : DB, if BC = 3 units, EB = 1 unit and DE is an angle bisector of $\angle CDB$ and DB is an angle bisector of $\angle ADE$.

- ☐ 2 : 3
- ☐ 1 : 3
- ☐ 1
- ☐ 4 : 5

Explanation:

In $\triangle DEC$, DB is angle bisector of external angle $\angle ADE$

By exterior angle bisector theorem,

$$\frac{DC}{DE} = \frac{BC}{EB} \quad \dots (i)$$

Now, in $\triangle DCB$, DE is angle bisector of internal angle $\angle CDB$

By interior angle theorem,

$$\frac{DC}{DB} = \frac{CE}{EB} \quad \dots (ii)$$

From (i) and (ii)

$$BC \times DE = CE \times DB$$

$$\text{i.e., } \frac{DE}{DB} = \frac{CE}{BC} = \frac{BC - EB}{BC} = \frac{3 - 1}{3} = \frac{2}{3}$$

Hence, [1].

Correct Answer:

Time taken by you: **371 secs**

Avg Time taken by all students: **109 secs**

Your Attempt: **Skipped**

% Students got it correct: **52 %**

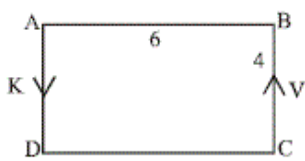
Kedar and Vishnu are moving along a rectangular track ABCD. Kedar starts cycling at 6 kmph from point A at 8:00 AM on the route A-D-C-B-A. Vishnu starts walking at 8:50 AM from point C at the speed of 1 kmph and takes the route C-B-A-D-C. AB = 6 km and BC = 4 km. At what time does Kedar just overtake Vishnu?

- ☐ 10:15 AM
- ☐ 9:00 AM
- ☒ 9:50 AM ✓
- ☐ 10:00 AM



Congratulations, you solved the question correctly and took less than average time!

Explanation:



At 8:50 AM, Kedar would have cycled $6 \times \frac{50}{60} = 5$ km.

\therefore He will be 5 km away from Vishnu.

\therefore He will overtake Vishnu in $\frac{5}{6-1} = 1$ hour after 8:50 AM, i.e., at 9:50 AM.

Hence, [3].

Correct Answer:

Time taken by you: **130 secs**

Avg Time taken by all students: **178 secs**

Your Attempt: **Correct**

% Students got it correct: **83 %**

Mr. Sharma received Rs. 20 lakh towards his retirement benefits. He wants to invest this amount prudentially in Monthly Income Plan (MIP), Bank deposits (FD) and Tax-free Bonds(Bond) so that he gets maximum returns. The minimum amount required to be invested in MIP and Bonds are Rs. 2 lakh each. The yield/return rate of MIP, FD and Bonds are 9%,10% and 8% respectively. If he wants to invest at least double the amount in MIP as compared to FD, then how much should Mr. Sharma invest in MIP and Bonds respectively to maximize return?

- ☐ Rs. 10 lakh, Rs. 5 lakh
- ☐ Rs. 12 lakh, Rs. 2 lakh
- ☐ Rs. 12 lakh, Rs. 6 lakh
- ☐ Rs. 8 lakh, Rs. 8 lakh



Explanation:



To maximize return, Mr. Sharma should invest maximum amount possible in FD and minimum possible amount in Bonds, since return rate of FD and Bonds are 10% and 8% respectively.

∴ Best combination possible is

MIP – 12 lakh

FD – 6 lakh and

Bonds – 2 lakh

Hence, [2].

Correct Answer:



Time taken by you: **4 secs**

Avg Time taken by all students: **152 secs**

Your Attempt: **Skipped**

% Students got it correct: **70 %**

Two chords AB and CD intersect at a point O inside a circle. If $AO : OB : OC = 5 : 2 : 3$, then find the ratio $OD : OC$.

- ☐ 11 : 10
- ☐ 9 : 10
- ☐ 9 : 8
- ☒ 10 : 9 ✓



Congratulations, you solved the question correctly and took less than average time!



Explanation:



We know that $AO \times OB = CO \times OD$

Let $AO = 5x$, $OB = 2x$ and $OC = 3x$.

$$\text{Therefore, } OD = \frac{AO \times OB}{OC} = \frac{10x}{3}$$

Required Ratio $OD : OC = 10 : 9$

Hence, [4].

Correct Answer:



Time taken by you: **56 secs**

Avg Time taken by all students: **108 secs**

Your Attempt: **Correct**

% Students got it correct: **87 %**

Area of sector of a circle that subtends angle 60° is 294π sq.cm. Chord AB and BC subtends angle of 60° and 120° at the centre of the circle. Which of the following can be the distance between A and C?

- ☐ 21 cm
- ☐ 35 cm
- ☐ 63 cm
- ☒ 84 cm ✓



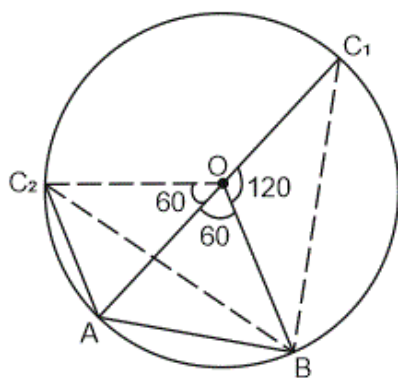
Congratulations, you got it correct!

Explanation:

Area of sector of a circle that subtends angle $60^\circ = \frac{\pi r^2}{6} = 294\pi$

$\Rightarrow r = 42$ cm

BC subtends an angle of 120° . Therefore, C can be at C_1 or C_2 as shown below.



If C is at C_1 , AC is a diameter $\Rightarrow AC = 2r = 84$ cm

If C is at C_2 , $m\angle AOC = 60^\circ \Rightarrow AC = r = 42$ cm

Hence, [4].

Correct Answer:

Time taken by you: 300 secs

Avg Time taken by all students: 141 secs

Your Attempt: Correct

% Students got it correct: 81 %

In a regular hexagon, the midpoints of four of the sides are joined to form a kite. Find the ratio of the area of the kite to that of the hexagon.

- ☒ 1 : 2 ✓
- ☐ 1 : 3
- ☐ $1 : 2\sqrt{3}$
- ☐ $1 : \sqrt{3}$

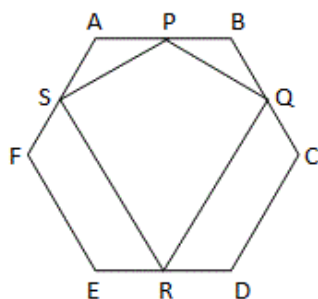


Congratulations, you got it correct!

04:06

Explanation:

The resultant figure will look as shown on the right:



Let $\ell(AB)$ be 'x'. Then $\ell(FC) = (2x)$.

We can show that $\ell(SQ) = 1.5x$ (median of trapezium ABCF).

Also, $\ell(PR) = \ell(AE) = \sqrt{3}x$.

Hence the area of the kite PQRS = $\frac{1}{2}$ product of diagonals = $\frac{1}{2} \times 1.5x \times \sqrt{3}x = \frac{3\sqrt{3}x^2}{4}$

The area of a regular hexagon with side x = $\frac{3\sqrt{3}x^2}{2}$

Correct Answer:

Time taken by you: 285 secs

Avg Time taken by all students: 59 secs

Your Attempt: Correct

% Students got it correct: 32 %

Five married couples participate in a mixed doubles tennis tournament. In how many ways can the teams consisting of one man and one woman each be formed out of these ten participants such that no team consists of two players who are married to each other?

- ☐ 45
- ☐ 44
- ☐ 25
- ☐ 50



Explanation:



The required answer is derangement of 5 = $5! \left(1 - \frac{1}{1!} + \frac{1}{2!} - \frac{1}{3!} + \frac{1}{4!} - \frac{1}{5!} \right) = 44$.

Hence, [2].

Correct Answer:



Time taken by you: **9 secs**

Avg Time taken by all students: **60 secs**

Your Attempt: **Skipped**

% Students got it correct: **43 %**

The time taken for one swing of a pendulum is directly proportional to the square root of its length. A pendulum 21 cm long is found to swing 30 times per minute. How many swings per minute will be made by a pendulum $\frac{28}{3}$ cm long?

☒ 45 ✓

☐ 20

☐ $\frac{40}{3}$

☐ 80



Congratulations, you got it correct!

01:59

Explanation:

Let the time for a swing be 't', the length be 'ℓ', then we can say $t = k\sqrt{\ell}$

Time for the first pendulum of length 21 = 2 seconds per swing.

Thus, $2 = k\sqrt{21}$

So $k = \frac{2}{\sqrt{21}}$

For the second pendulum $t' = k\sqrt{\ell'}$

$t' = \frac{2}{\sqrt{21}} \times \sqrt{\frac{28}{3}} = \frac{4}{3}$ seconds.

∴ Number of swings per minute = $60 \times \frac{3}{4} = 45$

Hence, [1].

Correct Answer:

Time taken by you: **183 secs**

Avg Time taken by all students: **70 secs**

Your Attempt: **Correct**

% Students got it correct: **42 %**

In how many ways a cube can be coloured using two colours if each colour should be used on at least one face?

Enter your response (as an integer) using the virtual keyboard in the box provided.



Oops, you got it wrong!

Explanation:

Following possibilities can be listed – (let the colors be C_1 and C_2)

Color	C_1	C_2	No of ways	Description
No of faces	1	5	1	
	2	4	$1 + 1 = 2$	Faces can be adjacent or opposite to each other
	3	3	$1 + 1 = 2$	Faces can be adjacent or opposite to each other
	4	2	$1 + 1 = 2$	Faces can be adjacent or opposite to each other
	5	1	1	
Total no of ways			8	

Therefore, the required answer is 8.

Correct Answer:

Time taken by you: **46 secs**

Avg Time taken by all students: **6 secs**

Your Attempt: **Wrong**

% Students got it correct: **6 %**

Ram purchased 'a' pencils for 'b' rupees. Shyam purchased 'b' erasers for 'a' rupees. After that Ram exchanges one pencil for an eraser with Shyam. Find the percentage gain or loss on the exchange for Ram if $a > b$?

- ☐ $\frac{(a^2 - b^2)}{b^2} \times 100\%$ gain
- ☐ $\frac{(a^2 - b^2)}{a^2} \times 100\%$ loss
- ☐ $\frac{(a^2 - b^2)}{b^2} \times 100\%$ loss
- ☒ None of these ❌



Oops, you got it wrong!

Explanation:

$$\text{CP of one pencil} = \frac{b}{a}$$

$$\text{CP of one eraser} = \frac{a}{b}$$

$$\text{As } a > b, \frac{a}{b} > \frac{b}{a}$$

So, Ram will have a gain.

$$\% \text{ gain} = \frac{\frac{a}{b} - \frac{b}{a}}{\frac{b}{a}} \times 100\% = \frac{a^2 - b^2}{b^2} \times 100$$

Hence, [1].

Correct Answer:

Time taken by you: **153 secs**

Avg Time taken by all students: **91 secs**

Your Attempt: **Wrong**

% Students got it correct: **56 %**

Sushil, Prakash and Vilas drive at 20 km/hr, 50 km/hr and 80 km/hr respectively. Sushil starts from point A for point B. Prakash starts from A, 2 hours after Sushil starts and Vilas leaves some time after Prakash from point A. Both Prakash and Vilas overtake Sushil at the same instant. How many hours after Sushil does Vilas leave point A?

- ☒ 2.5 hours ✓
- ☐ 4 hours
- ☐ 3.5 hours
- ☐ 4.5 hours



Congratulations, you solved the question correctly and took less than average time!

Explanation:

Prakash starts from A when Sushil has travelled $20 \times 2 = 40$ km.

Prakash overtakes Sushil, $\frac{40}{50 - 20} = \frac{4}{3}$ hrs after starting i.e., at $\frac{4}{3} \times 50 = \frac{200}{3}$ km

From point A.

Sushil travels this distance in $\frac{4}{3} + 2 = \frac{10}{3}$ hours.

Vilas travels this distance in $\frac{200}{3} \times \frac{1}{80} = \frac{5}{6}$ hours.

\therefore Vilas starts $\frac{10}{3} - \frac{5}{6} = \frac{20 - 5}{6} = \frac{15}{6} = 2.5$ hours after Sushil starts.

Hence, [1].

Correct Answer:

Time taken by you: **145 secs**

Avg Time taken by all students: **152 secs**

Your Attempt: **Correct**

% Students got it correct: **63 %**

The quadratic polynomial $f(x) = x^2 + bx + c$ takes a minimum value of -5 and $f(0) = 4$. What is the difference between the roots of equation $f(x) = 0$?

- ☐ $2\sqrt{5}$
- ☐ 4
- ☐ 6
- ☐ $4\sqrt{5}$

Explanation:

$$f(0) = c = 4$$

$$f(x) = \left(x + \frac{b}{2}\right)^2 + \left(4 - \frac{b^2}{4}\right) \quad (\text{Rearranging the terms}).$$

So, the minimum value of $f(x)$ is when $x = -\frac{b}{2}$ and the value is $4 - \frac{b^2}{4}$.

Equating this to -5 we get $b^2 = 36$. So $b = \pm 6$.

So, the value of $\frac{b}{c}$ can be either $-\frac{3}{2}$ or $\frac{3}{2}$ but cannot be determined uniquely.

However, we can observe that $f(x) = x^2 + 6x + 4 = (x + 3)^2 - 5$ or $x^2 - 6x + 4 = (x - 3)^2 - 5$. So, the roots are either $-3 \pm \sqrt{5}$ or $3 \pm \sqrt{5}$.

In either case, the difference between the roots is $2\sqrt{5}$.

Hence, [1].

Correct Answer:

Time taken by you: 239 secs

Avg Time taken by all students: 129 secs

Your Attempt: Skipped

% Students got it correct: 67 %

What values of x satisfy the equation $7x^{\frac{2}{3}} + 7x^{\frac{1}{3}} - 36 \leq 6$?

- ☐ $-3 \leq x \leq 2$
- ☒ $-27 \leq x \leq 8$ ✓
- ☐ $-2 \leq x \leq 3$
- ☐ $-8 \leq x \leq 27$



Congratulations, you solved the question correctly and took less than average time!

Explanation:

$$7x^{\frac{2}{3}} + 7x^{\frac{1}{3}} - 36 \leq 6$$

$$\therefore 7x^{\frac{2}{3}} + 7x^{\frac{1}{3}} - 42 \leq 0$$

$$\text{i.e., } x^{\frac{2}{3}} + x^{\frac{1}{3}} - 6 \leq 0$$

$$\text{Let } x^{\frac{1}{3}} = y$$

$$\therefore y^2 + y - 6 \leq 0$$

$$\therefore (y + 3)(y - 2) \leq 0$$

$$\therefore -3 \leq y \leq 2$$

$$\therefore -3 < \sqrt[3]{x} \leq 2$$

$$\therefore -27 \leq x \leq 8$$

Hence, $[2]$.

Correct Answer:

Time taken by you: 92 secs

Avg Time taken by all students: 106 secs

Your Attempt: Correct

% Students got it correct: 78 %



Raghav made a new year's resolution to exercise. On January 1, at 7 AM, he went for a jog from his home to the nearby park and back, returning at 7:32 AM. On January 2, at 7 AM, he went jogging to the park, but this time he walked back. Consequently he returned home at 7:40 AM. On January 3 too, he set out at 7 AM, but this time he walked both ways. At what time did he return home (assuming his jogging speed and his walking speed are fixed)?

- ☐ Between 7:41 AM and 7:45 AM
- ☐ Between 7:45 AM and 7:49 AM
- ☐ Between 7:49 AM and 7:53 AM
- ☐ Between 7:53 AM and 7:57 AM



Explanation:



On the first day, jogging both ways takes 32 minutes. So, jogging one way takes 16 minutes. Also, on the second day, jogging one way and walking one way takes 40 minutes. So, walking one way must take $40 - 16 = 24$ minutes. Hence, on the third day, walking both ways will take $24 \times 2 = 48$ minutes and hence he will reach home at 7:48 AM. Hence, [2].

Correct Answer:



Time taken by you: **2 secs**

Avg Time taken by all students: **118 secs**

Your Attempt: **Skipped**

% Students got it correct: **88 %**

Two pipes, named A and B are attached to a tank. Pipe A alone can completely fill the tank in 8 hours, while pipe B alone can completely fill the tank in 6 hours. Pipe A alone is operated for one hour, followed by pipe B alone for one hour. This cycle of two hours is repeated till the tank is completely full. In how many hours will the tank be completely full?

- ☒ 7 hours ✓
- ☐ 7 hours 12 minutes
- ☐ 7 hours 20 minutes
- ☐ 7 hours 36 minutes



Congratulations, you solved the question correctly and took less than average time!

Explanation:



LCM of 8 and 6 is 24. Therefore, let the volume of the tank be 24 litres.

Therefore, pipe A fills $\frac{24}{8} = 3$ litres per hour, while pipe B fills $\frac{24}{6} = 4$ litres per hour.

Therefore, the volume of the tank filled in 2 hours total $3 + 4 = 7$ litres.

Therefore, the volume of the tank filled in 6 hours $= 7 \times 3 = 21$ litres.

In the 7th hour, only pipe A is used. Since pipe A fills 3 litres per hour, total volume of the tank filled by the end of the 7th hour $= 21 + 3 = 24$ litres. Therefore, the tank will be full in 7 hours.

Hence, [1].

Correct Answer:



Time taken by you: **65 secs**

Avg Time taken by all students: **120 secs**

Your Attempt: **Correct**

% Students got it correct: **90 %**

Find the minimum value of $2a + \frac{1}{a} + \frac{1}{2b} + b$, where $a, b, > 0$.

- ☒ 4 ❌
- ☐ $3\sqrt{2}$
- ☐ 4.5
- ☐ None of these



Oops, you got it wrong!

Explanation:

$$2a + \frac{1}{a} + b + \frac{1}{2b}$$

$$= 2\left(a + \frac{1}{2a}\right) + \left(b + \frac{1}{2b}\right)$$

$$2\left(a + \frac{1}{2a}\right) + \left(b + \frac{1}{2b}\right) \text{ will be minimum}$$

when $\left(a + \frac{1}{2a}\right)$ & $\left(b + \frac{1}{2b}\right)$ are both minimum. $\left(a + \frac{1}{2a}\right)$ is minimum when

$$a = \frac{1}{2a} \Rightarrow 2a^2 = 1$$

$$\Rightarrow a = \frac{1}{\sqrt{2}}$$

Also, $\left(b + \frac{1}{2b}\right)$ is minimum when $b = \frac{1}{\sqrt{2}}$

$$\therefore \text{The sum} = 2\left(\frac{1}{\sqrt{2}} + \frac{\sqrt{2}}{2}\right) + \left(\frac{1}{\sqrt{2}} + \frac{\sqrt{2}}{2}\right)$$

$$= 2\left(\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}}\right) + \left(\frac{1}{\sqrt{2}} + \frac{1}{\sqrt{2}}\right)$$

Correct Answer:

Time taken by you: 74 secs

Avg Time taken by all students: 17 secs

Your Attempt: Wrong

% Students got it correct: 17 %

Aman and Baman were playing a game of guessing a five-digit number formed by using the digits 1, 2, 3, 4 and 5 exactly once. Aman thought of such a five-digit number and Baman kept guessing till he arrived at the correct number. Every time Baman guessed a number, Aman gave him points — one point if exactly one digit was at the correct place, two points if exactly two digits were at the correct place, and so on.

If Baman's first two guesses were 31254 and 13254, and he got 3 and 2 points for these guesses respectively, which of the following could not be the middle digit of the number that Aman thought of?

- ☐ 1
- ☐ 4
- ☐ 2
- ☐ 3

Explanation:

Baman's first two guesses were 31254 and 13254, and he got 3 and 2 points for them respectively.

He interchanged 1 and 3 in his second guess and, hence, got 1 point less.

Either of 3 or 1 was at the correct place and, hence, any two digits out of 2, 5 and 4 were at their correct place.

The five-digit number can be any one among the following:

(i)

(ii)

(iii)

(iv)

(v)

(vi)

(The squared digits are those which could be initially at the correct places.)

Thus, 4 cannot be the middle digit of the number.

Hence, [2].

Correct Answer:

Time taken by you: 3 secs

Avg Time taken by all students: 83 secs

Your Attempt: Skipped

% Students got it correct: 47 %

How many two-digit numbers are such that the product of their digits is a perfect square greater than 1?

Enter your response (as an integer) using the virtual keyboard in the box provided below.

Explanation:

Product of digits can be 4, 9, 16, 25, 36, 49, 64 or 81.

4 → 14, 22, 41

9 → 33, 19, 91

16 → 28, 44, 82

25 → 55

36 → 66, 49, 94

49 → 77

64 → 88

81 → 99

Thus, there are 16 such numbers.

Therefore, the required answer is 16.

Correct Answer:

Time taken by you: **83 secs**

Avg Time taken by all students: **56 secs**

Your Attempt: **Skipped**

% Students got it correct: **27 %**

Which of the following values of x , y and z satisfy both the given equations?

$$\left(\frac{x!}{4^y} + z\right)^{\frac{1}{y}} = 4\sqrt{3}$$

$$\text{and } z^{\frac{x}{y}} + y^{\frac{x}{z}} + x^{\frac{z}{y}} = 31 + 6\sqrt{6}$$

- ☐ $x = 6, y = 2$ and $z = -3$
- ☐ $x = 6, y = 2$ and $z = -2$
- ☐ $x = 5, y = 2$ and $z = 2$
- ☒ $x = 6, y = 2$ and $z = 3$ ✓



Congratulations, you solved the question correctly and took less than average time!

02:08

Explanation:

Note that $y = 2$ in all the options.

Therefore, the first equation becomes

$$\left(\frac{x!}{16} + z\right)^{1/2} = 4\sqrt{3}$$

Squaring both the sides,

$$\left(\frac{x!}{16} + z\right) = 48$$

For $x = 5$, LHS will not be an integer. Hence, option [3] is eliminated.

$$\text{For } x = 6, \frac{x!}{16} = 45$$

Therefore, $z = 3$.

Now, substitute $x = 6$, $y = 2$ and $z = 3$ in the second equation for cross checking

$$\begin{aligned} \therefore z^{\frac{x}{y}} + y^{\frac{x}{z}} + x^{\frac{z}{y}} &= 3^{\frac{6}{2}} \times 2^{\frac{6}{3}} \times 6^{\frac{3}{2}} \\ &= 3^3 + 2^2 + \sqrt{6^3} = 27 + 4 + 6\sqrt{6} \\ &= 31 + 6\sqrt{6} \end{aligned}$$

Hence, [4].

Correct Answer:

Time taken by you: 103 secs

Avg Time taken by all students: 150 secs

Your Attempt: Correct

% Students got it correct: 92 %

N is the least natural number such that whenever it is divided by k ($k = 1$ to 25) the remainder is $(k - 1)$. What is the number of digits of N?

- ☐ 11
- ☐ 12
- ☐ 13
- ☐ More than 13

Explanation:

Since the remainder is exactly one less than the divisor each time, we want the LCM $(1, 2, 3, \dots, 25) - 1$.

To find LCM of all the numbers from 1 to 25 we only need to consider the highest powers of the primes that occur in each of these numbers. E.g., The highest power of 2 occurring in these numbers is 16. So, the LCM will be divisible by 16 but not 32.

(Do not commit the folly of taking product of powers of 2 in all these numbers)

$$\text{So LCM} = 16 \times 9 \times 25 \times 7 \times 11 \times 13 \times 17 \times 19 \times 23$$

$$= (16 \times 25)(7 \times 11 \times 13)(17 \times 23)(9 \times 19)$$

$$= 400 \times 1001 \times 391 \times 171$$

$$= 156400 \times 1001 \times 171$$

Now, 1564×171 will have 6 digits (as $100 < 171 < 200$).

Therefore, 156400×171 will have 8 digits.

Therefore, $156400 \times 171 \times 1001$ will have $8 + 3 = 11$ digits.

Hence, [1].

Correct Answer:

Time taken by you: **51 secs**

Avg Time taken by all students: **57 secs**

Your Attempt: **Skipped**

% Students got it correct: **35 %**

A number when divided by 4 gives a number which is 3 more than the remainder obtained on dividing the number by 34. Find the least such number.

- ☐ 64
- ☒ 132 ✓
- ☐ 256
- ☐ None of these



Congratulations, you solved the question correctly and took less than average time!

Explanation:

Obviously the number is a multiple of 4. Let the number be $4n$ where $n = 1, 2, 3, \dots$

Also the number is of the form $34m + r$ where $m, r = 1, 2, 3, \dots$

$$\frac{4n}{4} = 3 + r$$

$$n = 3 + r$$

$$n = 3 + (4n - 34m) \quad \therefore 3n = 34m - 3$$

$\therefore m$ is 3, 6, 9,.....

$$\therefore n = \frac{34 \times 3 - 3}{3} = 33 \text{ and number } 4n$$

$$= 132.$$

Hence, [2].

Alternatively,

By plugging in values in the equation

$$\frac{x}{4}$$

$$= R\left[\frac{x}{34}\right] + 3 \text{ we get [2] as answer.}$$

Correct Answer:

Time taken by you: **54 secs**

Avg Time taken by all students: **103 secs**

Your Attempt: **Correct**

% Students got it correct: **61 %**



x_n are either -1 or 1 and $n > 5$, $x_1x_2x_3x_4x_5 + x_2x_3x_4x_5x_6 + \dots + x_{n-4}x_{n-3}x_{n-2}x_{n-1}x_n = 0$, then n has to be

- ☐ Odd
- ☐ Even
- ☐ Prime
- ☐ Cannot be determined

Explanation:



As x_n is either (-1) or $(+1)$, the product $x_1x_2x_3x_4x_5$ will be either (-1) or $(+1)$. For the sum to be zero there have to be equal number of (-1) and $(+1)$ i.e., the number of terms in the series must be even.

Now, for $n = 5$ we have only one term i.e., $x_1x_2x_3x_4x_5$ for $n = 6$ we have two terms i.e., $x_1x_2x_3x_4x_5$ and $x_2x_3x_4x_5x_6$.

\therefore For odd n , number of terms are odd. For even n , number of terms are even.

\therefore n has to be even.

Hence, [2].

Correct Answer:



Time taken by you: **0 secs**

Avg Time taken by all students: **90 secs**

Your Attempt: **Skipped**

% Students got it correct: **61 %**

