

Answer the questions independently of each other.

An equilateral triangle has one of its vertices at the origin and one median along the y-axis. Which of the following may be true?

- I. One side has an equation $x = y$.
- II. One vertex has coordinates $(2, 2\sqrt{3})$.
- III. One side has an equation $x = 3$.
- IV. The bisector of one angle has an equation $y = 0$.

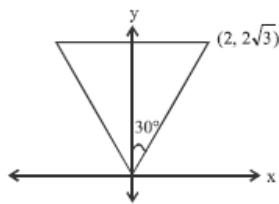
- Only I
- Only II
- IV and II 
- II and III



Oops, you got it wrong!



Explanation:



I is not true, as the inclination to x-axis is 45° for $x = y$. Here it is 60° .

Let x co-ordinate of a vertex be 2. Then the y co-ordinate is $2\sqrt{3}$.

\therefore Co-ordinates are $(2, 2\sqrt{3})$

\therefore II may be true.

III is false. We cannot have a side \parallel to y-axis. Also, the equation of a side cannot be $x = 3$.

IV is false. The bisector of the angle at the origin is $x = 0$ and not $y = 0$.

Hence, [2].

Correct Answer:



Time taken by you: **74 secs**

Avg Time taken by all students: **58 secs**

Your Attempt: **Wrong**

% Students got it correct: **33 %**

Answer the questions independently for each other.

In how many points do the graphs of $y = |x + 4|$ and $y = x^2 + 8x + 12$ intersect?

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

2



Congratulations, you got it correct!

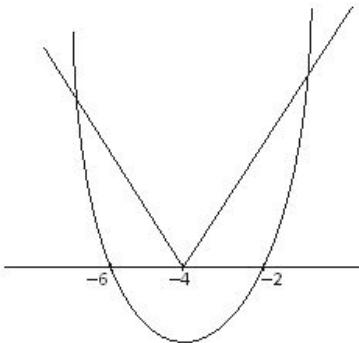
Explanation:

We have, $x^2 + 8x + 12 = (x + 6)(x + 2)$.

Therefore, the quadratic curve $y = x^2 + 8x + 12$ intersects x-axis at $x = -6$ and $x = -2$.

The graph of $y = |x + 4|$ consists of two lines having slope ± 1 above x-axis; touching the x-axis at $x = -4$.

The two graphs are as shown below:



Thus, the two graphs intersect each other in two points.

Therefore, the required answer is 2.

Correct Answer:

Time taken by you: 161 secs

Avg Time taken by all students: 82 secs

Your Attempt: Correct

% Students got it correct: 51 %

Answer the question independently of each other.

For what set of values of 'm' does the equation $x^2 - x + m^2 = 0$ possess no real roots?

- $(-\infty, -\frac{1}{2}) \cup (\frac{1}{2}, \infty)$ ✓
- $(-\infty, -1) \cup (\frac{1}{2}, \infty)$
- $(-\infty, -2) \cup (1, \infty)$
- $(-\infty, -1) \cup (1, \infty)$



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

**Explanation:**

$x^2 - x + m^2 = 0$ will have real roots, if discriminant $b^2 - 4ac \geq 0$

$$\text{i.e., } (-1)^2 - 4(1)(m^2) \geq 0 \text{ i.e., } 1 - 4m^2 \geq 0 \text{ i.e., } 4m^2 \leq 1 \text{ i.e., } m^2 \leq \frac{1}{4}$$

$$\text{i.e., } -\frac{1}{2} \leq m \leq \frac{1}{2}$$

∴ The expression will not have real roots, if

$$m \in \left(-\infty, -\frac{1}{2}\right) \cup \left(\frac{1}{2}, \infty\right). \text{ Hence, [1].}$$

Correct Answer:

Time taken by you: **32 secs**

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

Your Attempt: **Correct**

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



Answer the question independently of each other.

A train travelled a certain distance at a uniform speed. Had the speed been 6 kmph more, the journey would have taken 4 hours less and had the speed been 6 kmph less, the journey would have taken 6 hours more. Find the distance travelled by the train.

- 700 km
- 750 km
- 800 km
- 720 km ✓



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

**Explanation:**

Let the speed of the train be x kmph.

Let the time taken by the train be y hours.

Then, the distance will be xy km.

On the first supposition, the speed per hour is $(x + 6)$ km, time taken is $(y - 4)$ hours.

Then the distance travelled = $(x + 6)(y - 4)$ km

On the second supposition, the speed per hour is $(x - 6)$ km, time taken is $(y + 6)$ hours.

Then the distance travelled = $(x - 6)(y + 6)$ km

All these expressions for the distance must be equal.

$$\therefore xy = (x + 6)(y - 4) = (x - 6)(y + 6)$$

From these equations;

$$xy = xy + 6y - 4x - 24 \Rightarrow 6y - 4x = 24 \quad \dots (i)$$

Correct Answer:



Time taken by you: **126 secs**

Avg Time taken by all students: **236 secs**

Your Attempt: **Correct**

% Students got it correct: **91 %**

Answer the questions independently for each other.

A certain sum is invested with compound interest of 10% per annum. If the compound interest for the second year is Rs. 550, how much will be the compound interest for the fourth year on the same sum at the same rate of interest?

- Rs. 660
- Rs. 662.50
- Rs. 665.50 ✓
- Cannot be determined



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

**Explanation:**

If 'p' is the sum invested at r% compound interest per year, we have the following:

| Year | Principal | Interest | Amount |
|-------------|------------------|-----------------|---------------|
| 1 | P | Pr | $P(1 + r)$ |
| 2 | $P(1 + r)$ | $P(1 + r)r$ | $P(1 + r)^2$ |
| 3 | $P(1 + r)^2$ | $P(1 + r)^2r$ | $P(1 + r)^3$ |
| 4 | $P(1 + r)^3$ | $P(1 + r)^3r$ | $P(1 + r)^4$ |

$\therefore P(1 + r)r = 550$ and we have to calculate $P(1 + r)^3r$.

Taking the ratio, $\frac{P(1 + r)r}{P(1 + r)r} = (1 + r)^2$.

Therefore, the required answer is $(1 + r)^2$ times 550.

Since $r = 10\%$, the required answer = $550(1.1)^2 = 665.50$

Hence, [3].

Correct Answer:

Time taken by you: **103 secs**

Avg Time taken by all students: **201 secs**

Your Attempt: **Correct**

% Students got it correct: **85 %**



Answer the question independently for each other.

Let $x_1, x_2, \dots, x_9, y_1, y_2, \dots, y_9$ are all distinct positive integers less than 100 such that $x_1 < x_2 < x_3 < x_4 < \dots < x_9$ and $y_1 < y_2 < y_3 < y_4 < \dots < y_9$. Suppose arithmetic mean of x_1 and x_2 is less than arithmetic mean of $x_3, x_4, x_5, \dots, x_9$ by 9. Also, arithmetic mean of y_1 and y_2 is less than arithmetic mean of $y_3, y_4, y_5, \dots, y_9$ by 9. If the difference between arithmetic mean of $(x_1 \& x_2)$ and $(y_1 \& y_2)$ is maximum possible, which of the following is arithmetic mean of x_1, x_2, y_1, y_2 ?

- 48.5
- 46.5
- 44.5
- 42.5

Explanation:

$$\frac{x_3 + x_4 + \dots + x_9}{7} - \frac{x_1 + x_2}{2} = 9$$

$$\frac{x_3 + x_4 + \dots + x_9}{7} = \frac{x_1 + x_2}{2} + 9$$

$$x_3 + x_4 + \dots + x_9 = 7 \left(\frac{x_1 + x_2}{2} \right) + 63$$

$$x_1 + x_2 + x_3 + x_4 + \dots + x_9 = 9 \left(\frac{x_1 + x_2}{2} \right) + 63$$

Therefore $(x_1 + x_2)$ is even i.e., both x_1 and x_2 are odd or both are even.

Similarly,

$$y_1 + y_2 + y_3 + y_4 + \dots + y_9 = 9 \left(\frac{y_1 + y_2}{2} \right) + 63$$

Therefore $(y_1 + y_2)$ is even i.e., both y_1 and y_2 are odd or both are even.

For the difference between arithmetic mean of $(x_1 & x_2)$ and $(y_1 & y_2)$ to be maximum possible, $x_1 & x_2$ take minimum possible values and $y_1 & y_2$ take maximum possible values.

(Note: Without loss of generality, $(x_1 & x_2) < (y_1 & y_2)$)

The least values of x_1 and x_2 are 1 and 2

Correct Answer:

Time taken by you: 7 secs

Avg Time taken by all students: 79 secs

Your Attempt: Skipped

% Students got it correct: 37 %

Answer the question independently of each other.

A and B have a joint venture. The profits earned by A and B after 1 year are in the ratio $3 : 1 \frac{1}{6}$. A invested his sum at the start of the year and B joined exactly midway of the second quarter of the year.

What is the ratio of their initial investments?

- 45 : 28 ✓
- 45 : 29
- 33 : 7
- None of these



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

02:47

Explanation:

$$\begin{aligned}\text{The ratio of profits A : B} &= 3 : 1\frac{1}{6} \\ &= 3 : \frac{7}{6} \\ &= 18 : 7\end{aligned}$$

Period of investments of A and B
= 12 : 6 + 1.5 = 12 : 7.5 = 8 : 5

Now,

$$\begin{aligned}\frac{\text{Profit of A}}{\text{Profit of B}} &= \frac{\text{Amount of A}}{\text{Amount of B}} \times \frac{\text{Period of investment of A}}{\text{Period of investment of B}} \\ \therefore \text{Ratio of amount of A and B} &= \end{aligned}$$
$$\frac{5}{8} \times \frac{18}{7} = \frac{45}{28}. \quad \text{Hence, [1].}$$

Correct Answer:

Time taken by you: **98 secs**

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

Your Attempt: **Correct**

% Students got it correct: **60 %**

Answer the question independently of each other.

In a surprising pattern of an entrance test, there were 10 questions, each having two parts 'a' and 'b'. Find all the possible number of selections a student can make for answering one or more questions in the paper. (Note: The student can answer a question by attempting at least one out of part 'a' or part 'b' of the question.)

- 3^9
- $3^{10} - 1$ 
- 4^9
- $4^{10} - 1$



Oops, you got it wrong!

**Explanation:**

For each of the 10 questions, a student can either omit it or do part 'a' or part 'b' or both 'a' and 'b'. Hence, there are 4 ways to tackle each question. For 10 questions, we have 4^{10} ways. Finally subtract 1 to avoid the possibility of omitting all \Rightarrow Required answer = $4^{10} - 1$. Hence, [4].

Correct Answer:

Time taken by you: **99 secs**

Avg Time taken by all students: **55 secs**

Your Attempt: **Wrong**

% Students got it correct: **45 %**

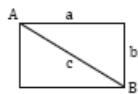
Answer the question independently of each other.

On a rectangular track, points A and B are diagonally opposite. If X starts running from point A towards point B along rectangular track, he takes 12 minutes more than he would have taken had he run along the straight path. This difference is 4 minutes for Y. Z travels half the distance with X's speed and remaining half with Y's speed taking 10 minutes to travel 9 km. Find the speed of Y (in m/s).

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

**Explanation:**

Let the rectangular track as follows:



Let speed of X, Y and Z be V_x , V_y and V_z respectively

$$\Rightarrow a + b = c + 12V_x$$

$$\text{and } a + b = c + 4V_y$$

$$\Rightarrow 3V_x = V_y$$

$$\text{Now, average speed} = V_z = \frac{3}{2}V_x$$

$$\therefore \frac{3}{2}V_x = \frac{9000}{10 \times 60}$$

$$\therefore V_x = 10 \text{ m/s.}$$

$$\therefore \text{Speed of Y} = V_y = 30 \text{ m/s}$$

Therefore , the required answer is 30.

Correct Answer:

Time taken by you: 27 secs

Avg Time taken by all students: 85 secs

Your Attempt: Skipped

% Students got it correct: 29 %

Answer the question independently for each other.

Suppose $f(x) = ax^2 - bx - 6$. The roots of a quadratic equation $g(x) = 0$ are the reciprocals of the roots of $f(x) = 0$. What is $g(x)$?

- $6x^2 + bx - a$ ✓
- $6x^2 - bx + a$
- $6x^2 + bx + a$
- $6x^2 + ax + b$



Congratulations, you got it correct!

05:46

Explanation:

Let α and β be the roots of $f(x) = 0$. Therefore, $\frac{1}{\alpha}$ and $\frac{1}{\beta}$ are roots of $g(x)$.

$$\text{Now, } \alpha + \beta = -\frac{b}{a} \text{ and } \alpha \times \beta = -\frac{a}{b}$$

$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{\alpha + \beta}{\alpha\beta} = -\frac{b}{6} \text{ and } \frac{1}{\alpha} \times \frac{1}{\beta} = \frac{1}{\alpha\beta} = -\frac{a}{6}$$

$$g(x) = x^2 - (\text{sum of the roots})x + \text{product of the roots} = 0$$

$$\therefore g(x) = x^2 + \frac{b}{6}x - \frac{a}{6}$$

$$\therefore g(x) = 6x^2 + bx - a$$

Hence, [1].

Correct Answer:

Time taken by you: 171 secs

Avg Time taken by all students: 123 secs

Your Attempt: **Correct**

% Students got it correct: 74 %

Answer the question independently for each other.

How many natural numbers between 1 and 1,000,000 (both included) are perfect squares but not perfect cubes?

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

900



Oops, you got it wrong!

**Explanation:**

$$1000000 = 1000^2 = 10^6$$

A number is both a perfect square and a perfect cube if and only if it is exactly a perfect sixth power.

So, the answer is the number of perfect squares, minus the number of perfect sixth powers, which is $1000 - 10 = 990$.

Therefore, the required answer is 990.

Correct Answer:

Time taken by you: 91 secs

Avg Time taken by all students: 49 secs

Your Attempt: Wrong

% Students got it correct: 27 %

Answer the question independently for each other.

If the volume of a cube is equal to the volume of a sphere, what is the ratio of the surface area of the cube to the surface area of the sphere?

$\frac{2}{3\pi} \left(\frac{4}{3}\pi\right)^{\frac{2}{3}}$

$\frac{3}{2\pi} \left(\frac{4}{3}\pi\right)^{\frac{2}{3}} \checkmark$

$\frac{4}{3\pi} \left(\frac{4}{3}\pi\right)^{\frac{2}{3}}$

$\frac{1}{3\pi} \left(\frac{4}{3}\pi\right)^{\frac{2}{3}}$



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

02:02 |

Explanation:

If the side of the cube = 'a' and the radius of the sphere = 'r', we have —

$$a^3 = \frac{4}{3} \pi r^3$$

$$\therefore \frac{a}{r} = \left(\frac{4}{3} \pi\right)^{\frac{1}{3}}$$

The surface area of the cube = $6a^2$ and the surface area of the sphere = $4\pi r^2$

$$\therefore \text{Required ratio} = \frac{6a^2}{4\pi r^2} = \frac{3}{2\pi} \left(\frac{a}{r}\right)^2 = \frac{3}{2\pi} \left(\frac{4}{3} \pi\right)^{\frac{2}{3}}$$

Hence, [2].

Correct Answer:

Time taken by you: 53 secs

Avg Time taken by all students: 147 secs

Your Attempt: Correct

% Students got it correct: 86 %

Answer the question independently for each other.

If $(x^x + y^y)^2$ is divisible by 5, where x and y are single-digit natural numbers, then what is the maximum value of $(x + y)$?

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

8



Oops, you got it wrong!

**Explanation:**

Since $(x^y + y^x)^2$ is divisible by 5, therefore $(x^y + y^x)$ is also divisible by 5.

Now, the unit's digit of p^p for values of p from 1 to 9 are as follows:

| | | | | | | | | | |
|-----------------------|---|---|---|---|---|---|---|---|---|
| p | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
| Unit's digit of p^p | 1 | 4 | 7 | 6 | 5 | 6 | 3 | 6 | 9 |

A sum with unit's digit 0 or 5 is possible for the pairs (1, 2), (1, 9), (2, 4), (2, 6), (2, 8), (3, 7), (4, 9), (6, 9) and (8, 9).

Therefore, the maximum value of $(x + y) = 8 + 9 = 17$.

Correct Answer:

Time taken by you: **131 secs**

Avg Time taken by all students: **38 secs**

Your Attempt: **Wrong**

% Students got it correct: **19 %**



Answer the question independently of each other.

The sum of the integers lying between 1 and 100 (both included) which are divisible by either 4 or 7 or both is:

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

1867



Congratulations, you got it correct!

**Explanation:**

We have two sets

$$A_1 = \{4, 8, \dots, 100\}$$

$$A_2 = \{7, 14, \dots, 98\}$$

We want sum of terms of $A_1 \cup A_2$ i.e., $S(A_1 \cup A_2) = S(A_1) + S(A_2) - S(A_1 \cap A_2)$

We have,

$$S(A_1) = 4 + 8 + 12 + \dots + 100 = \frac{25}{2} [4 + 100] = 25 \times 52 = 1300$$

$$S(A_2) = 7 + 14 + \dots + 98 = \frac{14}{2} [7 + 98] = 735$$

$$S(A_1 \cap A_2) = 28 + 56 + 84 = 168$$

$$\therefore S(A_1 \cup A_2) = 1300 + 735 - 168 = 1867$$

Therefore, the required answer is 1867.

Correct Answer:

Time taken by you: **119 secs**

Avg Time taken by all students: **58 secs**

Your Attempt: **Correct**

% Students got it correct: **24 %**

Answer the question independently of each other.

Amit and Jaya are married. They have two children Abhi and Sush. Sush is 2 years younger than Abhi. Six years ago, Amit was four times as old as his son Abhi. The present age of Jaya is $\frac{3}{2}$ times the average of Amit's age and Abhi's age four years ago. If the average age of all the members is 34 years, then find the present age of Sush (in years).

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

15



Oops, you got it wrong!

Explanation:

Let the present age of Sush be 'x' years.

Thus, the present age of Abhi will be $(x + 2)$ years.

Let the present age of Amit be 'a'.

$$a - 6 = 4(x + 2 - 6)$$

$$a - 6 = 4x - 16$$

$$a = 4x - 10$$

$$\text{The present age of Jaya will be } \frac{3}{2} \left[\frac{4x - 14 + x - 2}{2} \right] = \frac{3}{4} (5x - 16) = \frac{15x - 48}{4}$$

Average age of all the members is 34.

$$\therefore \frac{x + x + 2 + 4x - 10 + \frac{15x - 48}{4}}{4} = 34$$

$$\frac{6x - 8}{1} + \frac{15x - 48}{4} = 136$$

$$39x - 80 = 544$$

$$x = 16$$

Therefore, Sush's age will be 16 years.

Correct Answer:

Time taken by you: **265 secs**

Avg Time taken by all students: **143 secs**

Your Attempt: **Wrong**

% Students got it correct: **45 %**

Answer the question independently for each other.

Rajesh has to travel to meet his client over four consecutive days of the week: Monday, Tuesday, Wednesday and Thursday. He can travel using the following modes of transport: train, bus or auto. It is known that he does not take a train on consecutive days and takes an auto only if he took a bus on the previous day. If he took each mode of transport at least once, in how many ways could he have travelled over four days?

- 7
- 8
- 9
- More than 9 



Oops, you got it wrong!

Explanation:

He could have taken either a train or a bus on Monday. If he took a train on Monday, he definitely had to take a bus on Tuesday. If he took a bus on Monday, he could have taken any of the three modes on Tuesday.

Therefore we have the following cases for the modes of transport on Monday and Tuesday:

| Case | Monday | Tuesday |
|------|--------|---------|
| 1 | Train | Bus |
| 2 | Bus | Train |
| 3 | Bus | Bus |
| 4 | Bus | Auto |

We have the following:

Case 1 : He could have taken (Bus & Auto) or (Auto & Bus) or (Auto & Train) on Wednesday and Thursday respectively. (Total 3 cases)

Case 2 : He could have taken (Bus & Auto) on Wednesday and Thursday respectively. (Total 1 case)

Case 3 : He could have taken (Auto & Train) on Wednesday and Thursday respectively. (Total 1 case)

Case 4 : He could have taken (Bus & Train) or (Train & Bus) on Wednesday and Thursday respectively. (Total 2 cases)

∴ Total number of cases = $3 + 1 + 1 + 2 = 7$

Correct Answer:

Time taken by you: **111 secs**

Avg Time taken by all students: **126 secs**

Your Attempt: **Wrong**

% Students got it correct: **45 %**

Answer the question independently of each other.

Evaluate $\frac{1}{2} \log_{10} 25 - 2 \log_{10} 3 + \log_{10} 18$.

$3\frac{1}{2}$

$2\frac{1}{2}$

$1\frac{3}{4}$

$1\checkmark$



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

**Explanation:**

$$\begin{aligned} & \frac{1}{2} \log_{10} 5^2 - 2 \log_{10} 3 + \log_{10} 18 \\ &= \log_{10} 5^{2(\frac{1}{2})} - \log_{10} 3^2 + \log_{10} 18 = \log_{10} \left(\frac{5 \times 18}{9} \right) = \log_{10} 10 = 1. \text{ Hence, [4].} \end{aligned}$$

Correct Answer:

Time taken by you: **31 secs**

Avg Time taken by all students: **94 secs**

Your Attempt: **Correct**

% Students got it correct: **92 %**

Answer the question independently of each other.

Ratnadeep is distributing office supplies. In how many ways can he distribute 15 identical files among four employees Shrikant, Jay, Paresh and Nitin such that only Jay and Nitin are guaranteed to get a file?

- ${}^{17}C_3$
- ${}^{16}C_3$
- ${}^{13}C_3$
- ${}^{20}C_3$



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

**Explanation:**

Let the files given to Shrikant, Jay, Paresh and Nitin be s, j, p and n respectively.

$$s + j + p + n = 15$$

Values of 's' and 'p' can be 0.

Let $s_1 = s + 1$ and $p_1 = p + 1$

$\therefore (s_1) + j + (p_1) + n = 17$, where (s_1) , j, (p_1) and n are all nonzero.

Therefore, number of distinct solution to this equations = ${}^{(17-1)}C_{(4-1)}$

Hence, [2].

Correct Answer:

Time taken by you: **46 secs**

Avg Time taken by all students: **46 secs**

Your Attempt: **Correct**

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



Answer the question independently of each other.

The value of the sum $(8 \times 11 - 11 \times 10 + 10 \times 13 - 13 \times 12 + \dots + 30 \times 33 - 33 \times 32)$ is

- 618
- 528
- 400
- 342

01:55

Explanation:

$$8 \times 11 - 11 \times 10 + 10 \times 13 - 13 \times 12 + \dots + 30 \times 33 - 33 \times 32$$

$$= 11(8 - 10) + 13(10 - 12) + \dots + 33(30 - 32)$$

$$= (-2) \times (11 + 13 + \dots + 33)$$

$$= (-2) \times 12 \times \frac{11 + 33}{2} = -528$$

Hence, [2].

Correct Answer:

Time taken by you: **41 secs**

Avg Time taken by all students: **187 secs**

Your Attempt: **Skipped**

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

Answer the question independently of each other.

Two circles C₁ and C₂ have radii 10 cm and 12 cm respectively. If the length of the common chord of the two circles is 18 cm, what is the distance between the centers of the two circles (in cm)?

- $6 + \sqrt{19}$
- $6 + \sqrt{63}$
- $8 + \sqrt{19}$
- $\sqrt{63} + \sqrt{19}$ ✓

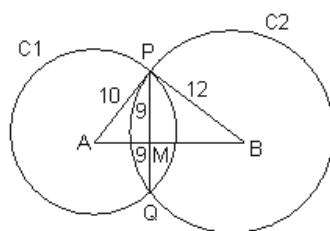


Congratulations, you solved the question correctly and took less than average time!

02:29

Explanation:

PQ is the common chord of length 18 cm. A and B are the centers of the two circles. Since A and B are the centers of the circles, the segment AB bisects chord PQ at M.



Using Pythagoras Theorem, $\ell(AM) = \sqrt{10^2 - 9^2} = \sqrt{19}$ cm and $\ell(BM) = \sqrt{12^2 - 9^2} = \sqrt{63}$ cm

Therefore the required answer = $\sqrt{63} + \sqrt{19}$

Hence, [4].

Correct Answer:

Time taken by you: 103 secs

Avg Time taken by all students: 122 secs

Your Attempt: **Correct**

% Students got it correct: 88 %

Answer the question independently of each other.

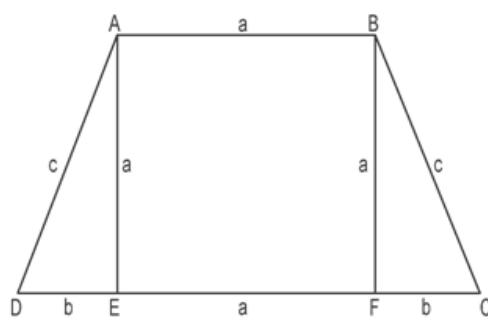
Ratio of area of an isosceles trapezium ABCD to area of square ABFE is 7 : 3. If F and E are points on DC such that D-E-F-C are in a straight line in that order, find the ratio of the area of trapezium ABCD to square of its perimeter.

- 7 : 6
- 7 : 12
- 7 : 81
- 7 : 192 ✓



Congratulations, you got it correct!

Explanation:



$$A(\square ABCD) = \frac{1}{2} \times (2a + 2b) \times a$$

$$\frac{A(\square ABCD)}{A(\square ABFE)} = \frac{\frac{1}{2} \times (2a + 2b) \times a}{a^2} = \frac{(a+b)}{a} = \frac{7}{3}$$

Therefore, $a:b = 3:4$

If $a = 3x$, $b = 4x$ then using Pythagoras theorem, $c = 5x$

$$A(\square ABCD) = \frac{1}{2} \times (2a + 2b) \times a = 21x^2$$

Correct Answer:

Time taken by you: **258 secs**

Avg Time taken by all students: **167 secs**

Your Attempt: **Correct**

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

Answer the question independently for each other.

Ajay and Vijay finish a piece of work in 24 days and 36 days respectively. They started working together but Ajay worked at $\frac{2}{3}$ rd of his usual efficiency while Vijay worked at only half of his usual efficiency. In how many days could the work be completed?

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

24



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

Explanation:

LCM of 24 and 36 = 72

Suppose the quantum of work to be done = 72 units.

$$\therefore \text{Work done by Ajay at 100\% efficiency} = \frac{72}{24} = 3 \text{ units/day.}$$

$$\text{And work done by Vijay at 100\% efficiency} = \frac{72}{36} = 2 \text{ units/day.}$$

$$\therefore \text{Work done by Ajay if he worked at } \frac{2}{3} \text{ rd of his usual efficiency} = 3 \times \frac{2}{3} = 2 \text{ units/day.}$$

$$\therefore \text{Work done by Vijay if he worked at half of his usual efficiency} = 2 \times \frac{1}{2} = 1 \text{ unit/day.}$$

$$\therefore \text{Total work done in a day if both worked together} = 2 + 1 = 3 \text{ units/day.}$$

$$\therefore \text{The number of days required to complete the work} = \frac{72}{3} = 24.$$

Therefore, the required answer is 24.

Correct Answer:

Time taken by you: 62 secs

Avg Time taken by all students: 106 secs

Your Attempt: **Correct**

% Students got it correct: 79 %

Answer the question independently for each other.

Find 'a', if $\log_{100} a + (\log_a 10^6)^{(-1)} + \log_{(10^{12})} a + (\log_a 10^{20})^{(-1)} + \log_{(10^{30})} a = 1$

$10^{\frac{6}{5}}$

$10^{\frac{1}{6}}$

$10^{\frac{5}{6}}$

10^6



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

Explanation:

$$\log_y x^n = \frac{n}{m} \log_y x \text{ and } \log_y x = \frac{1}{\log_x y}$$

$$\begin{aligned}\log_{100} a + (\log_a 10^6)^{(-1)} + \log_{(10^{12})} a + (\log_a 10^{20})^{(-1)} + \log_{(10^{30})} a \\= \log_{100} a + \log_{10^6} a + \log_{10^{12}} a + \log_{10^{20}} a + \log_{10^{30}} a \\= (\log_{10} a) \left(\frac{1}{2} + \frac{1}{6} + \frac{1}{12} + \frac{1}{20} + \frac{1}{30} \right) \\= (\log_{10} a) \left(\left(1 - \frac{1}{2}\right) + \left(\frac{1}{2} - \frac{1}{3}\right) + \left(\frac{1}{3} - \frac{1}{4}\right) + \left(\frac{1}{4} - \frac{1}{5}\right) + \left(\frac{1}{5} - \frac{1}{6}\right) \right) \\= (\log_{10} a) \left(1 - \frac{1}{6}\right) \\= (\log_{10} a) \left(\frac{5}{6}\right)\end{aligned}$$

Correct Answer:

Time taken by you: 91 secs

Avg Time taken by all students: 152 secs

Your Attempt: **Correct**

% Students got it correct: 80 %

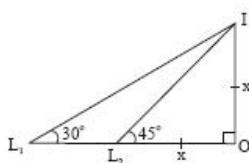
Answer the question independently of each other.

A lizard on the floor saw an insect on the wall. It moved towards the wall for 15 seconds and again looked at the insect. Due to this move, the angle of elevation changed from 30° to 45° . From this position, how much time (in Seconds) will the lizard take to reach the foot of the wall? (The insect remained at the same position and the lizard only travels in a straight line towards the wall)

- $15(1 + \sqrt{3})$
- $10(\sqrt{3} - \sqrt{2})$
- $\frac{15}{2}(\sqrt{3} + 1)$ ✓
- $12(\sqrt{3} - 1)$



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

Explanation:

L_1 and L_2 be the initial and final positions of the Lizard and I be that of the insect.

Let, $IO = L_2O = x$ (say)

In $\triangle L_1OI$; $L_1I = 2 \times x = 2x$;

$$L_1O = \frac{\sqrt{3}}{2} \times 2x = \sqrt{3}x$$

In $\triangle L_2OI$, $L_2O = IO = x$

$$\therefore L_1L_2 = (\sqrt{3} - 1)x$$

$$\text{Speed of lizard} = \frac{x(\sqrt{3}-1)}{15} \text{ units/sec.}$$

Time required for the lizard to reach foot of the wall

$$= \frac{x}{x(\sqrt{3}-1)} \times 15 = \frac{3 \times 15}{(\sqrt{3}-1)} = \frac{15}{2}(\sqrt{3}+1)$$

Correct Answer:

Time taken by you: 87 secs

Avg Time taken by all students: 156 secs

Your Attempt: **Correct**

% Students got it correct: 86 %

Answer the question independently of each other.

What is the area of a regular octagon inscribed in a circle having radius 20 cm? (in cm^2)

- $400\sqrt{2}$
- $800\sqrt{2}$ ✓
- $600\sqrt{2}$
- More information is needed to answer the question



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

**Explanation:**

If we join the vertices of the octagon to the center of the circle, we get 8 isosceles triangles.

Area of the octagon = 8(area of each isosceles triangle)

The angle inscribed by each isosceles triangle at the center of the circle = $\frac{360}{8} = 45^\circ$.

Two congruent sides of each isosceles triangle are equal to the radius of the circle = 20 cm

$$\therefore \text{Area of each isosceles triangle} = \frac{1}{2} \times 20 \times 20 \times \sin 45^\circ = \frac{1}{2} \times 20 \times 20 \times \frac{1}{\sqrt{2}} = 100\sqrt{2} \text{ cm}^2$$

$$\therefore \text{Area of the regular octagon} = 8 \times 100\sqrt{2} = 800\sqrt{2} \text{ cm}^2.$$

Hence, [2].

Correct Answer:

Time taken by you: 63 secs

Avg Time taken by all students: 106 secs

Your Attempt: **Correct**

% Students got it correct: 70 %



Answer the question independently of each other.

How many 3-digit numbers can be formed using the digits 0, 1, 2 if a digit can be used at most twice?

- 16✓
- 14
- 12
- 18



Congratulations, you got it correct!

**Explanation:**

Case 1 : When '1' is used in the hundred's place

| | | | | |
|----------|----------|--------------|---|-----------------|
| <u>1</u> | <u>1</u> | <u>0/2</u> | → | 2 possibilities |
| <u>1</u> | <u>2</u> | <u>1/0/2</u> | → | 3 possibilities |
| <u>1</u> | <u>0</u> | <u>1/0/2</u> | → | 3 possibilities |

Case 2 : When '2' is used in the hundred's place

| | | | | |
|----------|----------|--------------|---|-----------------|
| <u>2</u> | <u>1</u> | <u>0/1/2</u> | → | 3 possibilities |
| <u>2</u> | <u>2</u> | <u>0/1</u> | → | 2 possibilities |
| <u>2</u> | <u>0</u> | <u>0/1/2</u> | → | 3 possibilities |

Therefore, total number of possibilities is $8 + 8 = 16$

Hence, [1].

Correct Answer:

Time taken by you: **124 secs**

Avg Time taken by all students: **68 secs**

Your Attempt: **Correct**

% Students got it correct: **38 %**

Answer the question independently for each other.

If $5^k > 26^{25}$, where 'k' is a natural number, which of the following is closest to the least value of 'k'?

- 51✓
- 50
- 47
- 45



Congratulations, you got it correct!

**Explanation:**

By the given condition,

$$5^k > 26^{25}$$

Taking log on both the sides, we get,

$$k \times \log 5 > 25 \times \log 26 > 25 \times \log 25 = 50 \times \log 5$$

Therefore, $k > 50$

Now using the options, we can conclude that $k = 51$

Hence, [1].

Correct Answer:

Time taken by you: **159 secs**

Avg Time taken by all students: **78 secs**

Your Attempt: **Correct**

% Students got it correct: **82 %**



Answer the question independently for each other.

If $f(x) = \min(3x + 2, 1 - 5x)$, what is the maximum possible value of $f(x)$?

- $\frac{7}{8}$
- $\frac{8}{7}$
- $\frac{8}{13}$
- $\frac{13}{8}$ ✓



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

**Explanation:**

$$f(x) = \min(3x + 2, 1 - 5x)$$

The function has maximum value when $3x + 1 = 1 - 5x$

$$\therefore 8x = -1 \Rightarrow x = -\frac{1}{8}$$

∴ The maximum value of $f(x)$ is

$$\begin{aligned} f\left(-\frac{1}{8}\right) &= \min \left[3\left(-\frac{1}{8}\right) + 2, 1 - 5\left(\frac{-1}{8}\right) \right] \\ &= \min \left[\frac{13}{8}, \frac{13}{8} \right] = \frac{13}{8} \end{aligned}$$

Hence, [4].

Correct Answer:

Time taken by you: **31 secs**

Avg Time taken by all students: **94 secs**

Your Attempt: **Correct**

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

Answer the question independently of each other.

An interest on a particular investment for the first month at 12% p.a. is Rs. 50. The interest at the same rate compounded monthly on the same principal for one year will be approximately:

- Rs. 600 
- Rs. 634
- Rs. 650
- Rs. 660



Oops, you got it wrong!

Explanation:

Let the investment be Rs. X.

$$\frac{X \times 12}{100 \times 12} = 50$$

$$\Rightarrow X = 5000$$

Note that the compound interest will definitely be greater than $50 \times 12 = \text{Rs. } 600$

$$\text{Amount at the end of a year} = 5000 \left(1 + \frac{12}{12 \times 100}\right)^{12} = 5000(1.01)^{12}$$

$$\text{Now, } (1.01)^{12} = (1 + 0.01)^{12}$$

Using binomial expansion,

$$(1.01)^{12} = (1)^{12} + {}^{12}C_1(1)^{12}(0.01)^1 + {}^{12}C_2(1)^{10}(0.01)^2 + {}^{12}C_3(1)^9(0.01)^3 + \dots$$

$$= 1 + 12(0.01) + 66(0.0001) + 220(0.000001) + \dots$$

= 1.12682 + ... (Note : The remaining terms will be very small and hence can be neglected)

$$\therefore (1.01)^{12} \approx 1.12682$$

$$\therefore 5000(1.01)^{12} \approx 5000(1.12682) \text{ or } 5634.$$

$$\therefore \text{Required compound interest} \approx 5634 - 5000 \approx 634$$

Correct Answer:

Time taken by you: **93 secs**

Avg Time taken by all students: **85 secs**

Your Attempt: **Wrong**

% Students got it correct: **40 %**

Answer the question independently of each other.

Students of Polyglot Foreign language institute study at least one language among German, French and Spanish. It is known that 36 students study German, 36 students study French and 36 students study Spanish. It is also known that 36 students study two languages and 8 students study all the three languages. How many students study at the institute?

- 72
- 108 ✗
- 56
- 68



Oops, you got it wrong!

**Explanation:**

Given: 36 students study German, French and Spanish.

If each student had studied only one language, total number of students would have been $36 + 36 + 36 = 108$

For every student who studies two languages (say German and French), we need to deduct one student each from the number of students who study those two languages (German and French in this example). Thus, every student who studies two languages results in the change of $+1 - 1 - 1 = -1$ (i.e., decrease of 1) in the sum 108 given above. On similar lines, every student who studies three languages results in the change of $+1 - 1 - 1 - 1 = -2$ (i.e., decrease of 2) in the sum 108 given above.

Therefore, total number of students = $108 - 36(1) - 8(2) = 56$

Hence, [3].

**Correct Answer:**

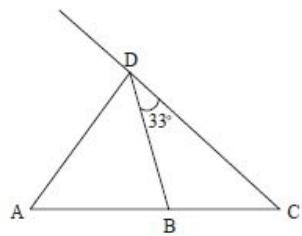
Time taken by you: **125 secs**

Avg Time taken by all students: **125 secs**

Your Attempt: **Wrong**

% Students got it correct: **64 %**

Answer the question independently of each other.

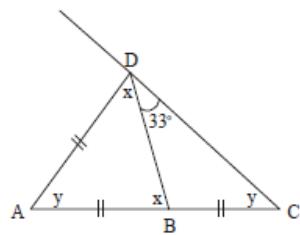


In the figure (not drawn to scale) given above, if $AD = AB = DC$ and $\angle BDC = 33^\circ$. $m\angle ABD = ?$

- 38°
- 71° ✓
- 64°
- 56°



Congratulations, you got it correct!

Explanation:

In $\triangle ABD$, $2x + y = 180^\circ \dots (1)$

$\angle DBC = x + y \dots$ (exterior angle)

In $\triangle DBC$, $x + y + 33^\circ = 180^\circ$

i.e., $x + 2y = 147^\circ \dots (2)$

Solving (1) and (2), we get $y = 38$ and $x = 71^\circ$.

Hence, [2].

Correct Answer:

Time taken by you: **216 secs**

Avg Time taken by all students: **171 secs**

Your Attempt: **Correct**

% Students got it correct: **78 %**

Answer the question independently of each other.

Ajay bought a new car and went for a trip. There was a slight defect with the odometer (which shows the distance travelled) because of which it could not display the digit 9.

For example, after the number 000018 it will show 000020.

At the end of the trip the odometer read 001245. What is the exact distance traveled by Ajay in the new car? (Assume that the odometer read 000000 when Ajay bought it)

- 1300
- 931
- 932
- 755

Explanation:

As 9 is not available in the digits of the odometer, we can think this situation as the odometer using base 9 i.e., digits 0-8 system to show the distance traveled. Hence, we have to find the decimal equivalent of $(1245)_9$.
 $= 5 \times 9^0 + 4 \times 9^1 + 2 \times 9^2 + 1 \times 9^3 = 932$.
Hence, [3].

Correct Answer:

Time taken by you: **11 secs**

Avg Time taken by all students: **111 secs**

Your Attempt: **Skipped**

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

Answer the question independently for each other.

An overhead tank that supplies water to a housing society has two pumps, named P and Q that fill the tank. Every day, either pump P or pump Q or both are started at the same time and the tank is filled. On day 1, only pump P is used to fill the tank and the tank is completely filled at 4 pm. On day 2, only pump Q is used to fill the tank and the tank is completely filled at 3 pm. On day 3, only pump P is operated up to 2 pm, post which only pump Q is operated and the tank is completely filled at 3:30 pm. What time of the day the pump(s) is/are started every day?

- 10:30 am
- 12 noon ✓
- 11 am
- None of these



Congratulations, you got it correct!

06:51

Explanation:

If pump P is used, the tank is filled at 4 pm and if pump Q is used, the tank is filled at 3 pm.
∴ Pump P takes 't' hours and pump Q takes 't-1' hours to fill the tank, when used alone.
If only pump P is used up to 2 pm, it is used for 't-2' hours and pump Q is used up to 3:30 pm
i.e., for 1.5 hours.

$$\therefore \frac{t-2}{t} + \frac{1.5}{t-1} = 1$$

$$\therefore t^2 - 3t + 2 + 1.5 = t^2 - t$$

$$\therefore -1.5t + 2 = -t$$

$$\therefore t = 4$$

Therefore, pump P is operated for 4 hours i.e., the pumps are started at 12 noon.

Hence, [2].

Correct Answer:

Time taken by you: **235 secs**

Avg Time taken by all students: **176 secs**

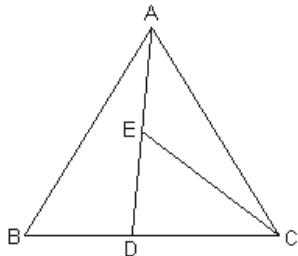
Your Attempt: **Correct**

% Students got it correct: **84 %**

Answer the question independently of each other.

In the figure given below, $BD : DC = 2 : 3$ and the ratio of areas of $\triangle DEC$ to $\triangle ABD$ is $1 : 5$. What is the ratio $AE : ED$?

$\triangle DEC$ to $\triangle ABD$ is $1 : 5$. What is the ratio $AE : ED$?



- 14 : 1
- 13 : 1
- 5 : 2
- 13 : 2 ✓



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

**Explanation:**

Given that $BD : DC = 2 : 3$

Therefore, the area of ΔABD to ΔADC is in the ratio $2 : 3$.

Let the areas of the ΔABD and ΔADC be $2x$ and $3x$ respectively.

Given that ratio of area of ΔDEC to ΔABD is $1 : 5$

Therefore, $A(\Delta DEC) = 0.4x$

$A(\Delta AEC) = 3x - 0.4x = 2.6x$

$$\frac{AE}{ED} = \frac{A(\Delta AEC)}{A(\Delta DEC)} = \frac{2.6x}{0.4x} = 13 : 2$$

Hence, [4].

Correct Answer:

Time taken by you: **114 secs**

Avg Time taken by all students: **138 secs**

Your Attempt: **Correct**

% Students got it correct: **62 %**



