Answer the question independently of each other.

A and B start walking simultaneously towards each other. When A covers 5 km in 3 hours, the distance between A and B is $\frac{1^{rd}}{3}$ the initial distance between them. When A covers that $\frac{1^{rd}}{3}$ distance, B reaches A's starting point. Find B's approximate speed.

- 2.9 kmph
- 4 kmph
- 1 kmph
- 3.6 kmph ✖

Oops, you got it wrong!

Explanation:

Let the initial distance between 'A' and 'B' be 3x km.

When 'A' covers 5 km, B is 'x' km away from him.

Therefore, distance travelled by B = 3x – (x + 5) = (2x – 5) km

$$\therefore \frac{\text{Speed of A}}{\text{Speed of B}} = \frac{5}{2x-5} \quad \ldots. \text{(i)}$$

Also,

$$\frac{\text{Speed of A}}{\text{Speed of B}} = \frac{5+x}{3x} \quad \ldots. \text{(ii)}$$

from (i) and (ii),

$$\frac{5}{2x-5} = \frac{5+x}{3x}$$

$\therefore 5x + 25 = 2x^2 - 5x$

$\therefore 2x^2 - 10x - 25 = 0$

$$\therefore x = \frac{10 \pm \sqrt{100+200}}{4} = 2.5\,(1 \pm \sqrt{3})$$

But $x = 2.5(1 - \sqrt{3})$ is not possible.

$\therefore x \approx 2.5\,(1 + 1.732) = 6.83$

Correct Answer:

Time taken by you: **345 secs**

Avg Time taken by all students: **136 secs**

Your Attempt: **Wrong**

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

Answer each of these questions independently.

A cylinder is filled to the brim with water. A new cylindrical container holds 20% more water. How many times of the radius of the old container should the radius of the new container be if the height of the new container is less than the height of the old container by 40%?

- $\sqrt{2}$ ✓
- $(\sqrt{2}-1)$
- $(\sqrt{3}+1)$
- $\sqrt{3}$

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

Explanation:

Let 'r' and 'h' be the radius and height of the old container and 'R' be the radius of the new container.

Volume of the old container = $\pi r^2 h$

$\therefore$ Volume of the new container = $1.2(\pi r^2 h)$

Height of the new container = $0.6h$

$1.2(\pi r^2 h) = \pi R^2 \times 0.6h$

$$\therefore \frac{R^2}{r^2} = \frac{1.2}{0.6} = 2$$

$$\therefore R = \sqrt{2} \times r$$

Hence, [1].

Correct Answer:

Time taken by you: **111 secs**

Avg Time taken by all students: **170 secs**

Your Attempt: **Correct**

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

Answer the question independently of each other.

Using only 3, 4, 5, 7 and 9 as digits, how many distinct natural numbers, can be made if the last digit is a perfect square and the first digit is a prime number? All digits may not be used but no digit can be repeated.

- 48
- 49
- 96
- 98

Explanation:

Only 2-digit, 3-digit, 4-digit or 5-digit numbers can satisfy the two given conditions. For each of the above cases, there are possibilities for the leftmost digit, namely 3, 5 and 7 and two possibilities for the rightmost digit, 4 and 9. Therefore, regardless of the number of digits, we will have 6 different combinations for the first and last digits taken together. Now, depending on the number of digits, we can find the total number of combinations that can be formed with that many digits.

For a 5-digit number, there are ${}^3C_3 \times 3!$ possible arrangements for the remaining three digits. Hence, a total of $6 \times 6 = 36$ arrangements are possible.

For a 4-digit number, for each of the above 6 combinations, there will be ${}^3C_2 \times 2!$ possibilities for the remaining 2 digits. Hence, a total of $6 \times 6 = 36$ numbers are possible.

For a 3-digit numbers, we will have ${}^3C_1 \times 1!$ possible arrangements for the remaining digit. Hence, a total of $6 \times 3 = 18$ numbers are possible.

For a 2-digit number, 6 arrangements are possible.

Hence, a total of $36 + 36 + 18 + 6 = 96$ arrangements are possible.

Hence, [3].

Correct Answer:

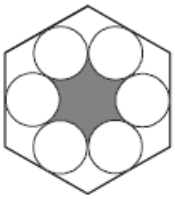
Time taken by you: **9 secs**

Avg Time taken by all students: **162 secs**

Your Attempt: **Skipped**

% Students got it correct: **71 %**

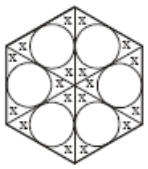
Answer the question independently of each other.



A regular hexagon is taken and six circles are drawn inside it such that each circle just touches the center of one of the sides of the hexagon and also touches the two neighboring circles, as shown in the accompanying figure. Find the ratio of the shaded area to the unshaded area within the hexagon but outside the circles.

- 1 : 2
- 2 : 1
- 1 : 1
- $2 : \sqrt{3}$

Explanation:



If we join the opposite vertices of the hexagon (as shown in the figure) we can clearly see that all the areas marked with an 'x' are equal. Hence, the area of the shaded region would be (6x) while that of the remaining part would be (12x) and hence the required ratio would be 1 : 2. Hence, [1].

Correct Answer:

Time taken by you: **171 secs**

Avg Time taken by all students: **86 secs**

Your Attempt: **Skipped**

% Students got it correct: **47 %**

Answer the questions independently of each other.

Aastha can do a work in 30 days, while Priyanka can do the same work in 45 days. Aastha started the work and was joined by Priyanka after 5 days. At the end of 10th day, they had an argument and Aastha quit. How many more days did Priyanka take to complete the work? (Both worked at 100% efficiency on all days they worked.)

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

25

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

Explanation:

Let Aastha completes ‘a’ units of work in one day, while Priyanka completes ‘p’ units of the work.

∴ 30a = 45p ⇒ a = 1.5p

Work done in first 5 days = 5a

Work done in next 5 days = 5a + 5p

Assume that Priyanka needs ‘x’ days to complete the remaining work.

∴ (5a) + (5a + 5p) + xp = 45p

∴ 10a +5p + xp = 45p

∴ 10(1.5p) + 5p + xp = 45p

∴ 20p + xp = 45p

∴ x = 25

Therefore, the required answer is 25.

Correct Answer:

Time taken by you: **86 secs**

Avg Time taken by all students: **122 secs**

Your Attempt: **Correct**

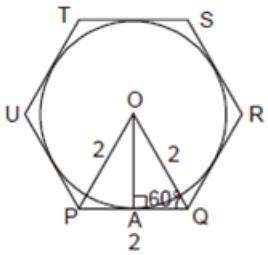
% Students got it correct: **70 %**

Answer the questions independently of each other.

A regular hexagon, whose side is 2 m, has its corners cut away so as to form a circle of maximum size. What is the radius of the circle so formed? Specify the measure in metres.

- $\sqrt{3}$
- $\sqrt{2}$
- $\frac{\sqrt{3}+1}{2}$
- None of these

Explanation:



PQ = 2 m $\quad \therefore$ OP = OQ = 2 m

$\therefore$ OA = $\frac{\sqrt{3}}{2}$ OQ = $\frac{\sqrt{3}}{2} \times 2 = \sqrt{3}$ m.

Hence, [1].

Correct Answer:

Time taken by you: **16 secs**

Avg Time taken by all students: **87 secs**

Your Attempt: **Skipped**

% Students got it correct: **71 %**

Answer the questions independently of each other.

Find the value of: $1 + \frac{a^2 - b^2}{a - b} + \frac{a^3 - b^3}{a - b} + \ldots + \frac{a^{9999} - b^{9999}}{a - b}$

where 'a' and 'b' are the roots of the equation $x^2 = 1$ such that $a > b$.

- 1
- 9999
- 5000 ✔
- 4999

Congratulations, you got it correct!

Explanation:

$$1+\frac{a^2-b^2}{a-b}+\frac{a^3-b^3}{a-b}+\ldots+\frac{a^{9999}-b^{9999}}{a-b}$$

All terms having even powers of a & b are zero.

All terms having odd powers of a & b are 1.

There are 4999 terms having odd powers of a & b.

Hence, answer is 1 + 4999 = 5000.

Hence, [3].

Correct Answer:

Time taken by you: **162 secs**

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

Your Attempt: **Correct**

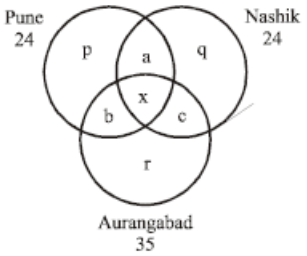
% Students got it correct: **62 %**

Answer the question independently of each other.

A group of 52 persons own houses in one or more of the cities, namely, Pune, Nashik and Aurangabad. Of them 24 persons own houses in Pune and an equal number of persons own houses in Nashik. 35 persons own houses in Aurangabad. No person owns more than one house in any city. If 13 persons own houses in exactly two of the three cities, then how many persons have houses in all the three cities?

- 13
- 9
- 5
- 18

Explanation:



$p + q + r + (a + b + c) + x = 52$
$\therefore p + q + r + x = 52 - 13 = 39$ ... (i)
Also, $(p + a + b + x) + (q + a + c + x) + (r + b + c + x) = 24 + 24 + 35 = 83$
$\therefore p + q + r + 2 \times (a + b + c) + 3x = 83$
$\therefore p + q + r + 3x = 57$ ... (ii)
Solving (i) and (ii), we get, $x = 9$.
Hence, [2].

Correct Answer:

Time taken by you: **20 secs**

Avg Time taken by all students: **123 secs**

Your Attempt: **Skipped**

% Students got it correct: **58 %**

Answer the questions independently of each other.

The numbers 1 to n are written side by side to get a new number as 1234567891011....(n – 1)n. Which of the following can be the value of n, if this new number is divisible by 99?

- 39
- 26
- 45
- None of these

Explanation:

If '1234567891011...(n − 1)n' is divisible by 99, it is divisible by 9 and 11 both.

If the new number is divisible by 9, then $\frac{n \times (n+1)}{2}$ is a multiple of 9.

Then, n × (n + 1) = 18k; k is a positive integer.

Since, 39 × 40 is not divisible by 9, n cannot be 39.

Thus, option [1] is eliminated.

For n = 26, 26 × 27 is divisible by 9 and for n = 45, 45 × 46 is divisible by 9.

Now, we need to check whether for n = 26 or 45, the new number formed is divisible by 11 or not.

For n = 26, sum of odd placed digits = 1 + 3 + 5 + 7 + 9 + (0 + 1 + … + 9) + (0 + 1 + 2 + … + 6) = 91 and sum of even placed digits = 2 + 4 + 6 + 8 + 1 × 10 + 2 × 7 = 44

As 91 – 44 = 47 is not a multiple of 11, the new number formed is not divisible by 11.

Hence, 'n' cannot be 26.

For n = 45, sum of odd placed digits – sum of even placed digits = 175 – 104 = 71 is not a multiple of 11. Hence, 'n' cannot be 45.

Hence, [4].

Correct Answer:

Time taken by you: **308 secs**

Avg Time taken by all students: **92 secs**

Your Attempt: **Skipped**

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

Answer the question independently of each other.

Sameer purchased a pen and a pencil from a shop. The price of the pencil was less than 15% of that of pen. Had the cost of the pen been increased by Rs. 10 then cost of the pencil would have been more than 10% of the new cost of the pen. What can be the minimum possible cost of the pen? (Cost of the pencil and cost of the pen are integer values.)

- Rs. 27
- Rs. 30
- Rs. 17
- Rs. 7 ✖

Oops, you got it wrong!

Explanation:

Let cost of the pen be Rs. y and that of the pencil be Rs. x.

By the given conditions,

(i) $x < 0.15y$

(ii) $(y + 10) \times 0.1 < x$

From (i) and (ii), we get

$0.1y + 1 < x < 0.15y$

$\therefore 1 < 0.05y$

$\therefore 20 < y$

$\therefore 0.1 \times 20 + 1 < 0.1y + 1 < 3 \Rightarrow 3 < x$

As $y > 20$, options [3] and [4] can be eliminated.

For $y = 27$, we get $0.1y + 1 < x < 0.15y \Rightarrow 3.7 < x < 4.05 \Rightarrow$ value of $x = 4$

For $y = 30$, we get $0.1y + 1 < x < 0.15y \Rightarrow 4 < x < 4.5 \Rightarrow$ No integer value for x is possible.

Hence, [1].

Correct Answer:

Time taken by you: **152 secs**

Avg Time taken by all students: **95 secs**

Your Attempt: **Wrong**

% Students got it correct: **36 %**

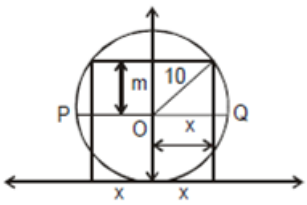
Answer the questions independently to each other.

A square piece of paper is to be fixed on a circular frisbee in such a way that two of its vertices are on the rim of the frisbee and the other two vertices are outside the frisbee and the mid point of one side touches the circumference of the frisbee. If the diameter of the frisbee is 20 cm, find the length (in cm)of the sides of the square paper.

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

Explanation:

The diagram can be drawn as follows:



O is the centre of the Frisbee.

PQ = 20 cm.

Now, we have, $2x = 10 + m$ ... (i)

and $(10)^2 = m^2 + x^2$ ...(ii)

From (i) and (ii)

$100 = (2x - 10)^2 + x^2$

$\therefore 100 = 4x^2 - 40x + 100 + x^2$

$\therefore 5x^2 = 40x$

Correct Answer:

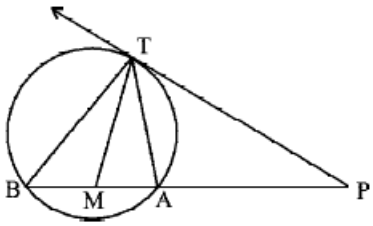
Time taken by you: **8 secs**

Avg Time taken by all students: **22 secs**

Your Attempt: **Skipped**

% Students got it correct: **10 %**

Answer the questions independently of each other.



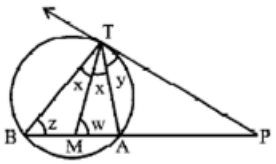
In the given figure, the length of tangent PT = 6 cm and TM is the angle bisector of ∠BTA. If PB = 12 cm, find the length of AM.

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

4.5 cm

Oops, you got it wrong!

Explanation:



y = z (angles inscribing the same arc) and w = x + z (exterior angle)

Therefore, w = x + y

Thus, ΔPTM is isosceles triangle.

∴ PM = PT = 6 cm

By tangent-secant theorem, $PT^2 = PA \times PB$

⇒ 36 = PA × 12 ⇒ PA = 3 cm

∴ AM = PM – PA = 6 – 3 = 3 cm

Therefore, the required answer is 3.

Correct Answer:

Time taken by you: **149 secs**

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

Your Attempt: **Wrong**

% Students got it correct: **30 %**

Answer the question independently of each other.

$f^0(x) = 1 - x$ if $x > 0$, $f^0(x) = \frac{1}{1-x}$ if $x \leq 0$ also $f^n(x) = f^0(f^{n-1}(x))$. If $x = -1$, find $f^1(x)f^2(x)f^3(x)f^4(x) \ldots f^8(x)$.

- $\frac{1}{512}$
- $\frac{1}{128}$
- $\frac{1}{256}$
- $\frac{1}{1024}$

Explanation:

$f^0(-1) = \frac{1}{2}$

$f^1(-1) = f^0(f^0(-1)) = f^0\left(\frac{1}{2}\right) = 1 - \frac{1}{2} = \frac{1}{2}$

$f^2(-1) = f^0(f^1(-1)) = f^0\left(\frac{1}{2}\right) = \frac{1}{2}$

$f^3(-1) = f^0(f^2(-1)) = f^0\left(\frac{1}{2}\right) = \frac{1}{2}$

Similarly, $f^4(-1) = \frac{1}{2}$

$f^5(-1) = \frac{1}{2}$, $f^6(-1) = \frac{1}{2}$, $f^7(-1) = \frac{1}{2}$, $f^8(-1) = \frac{1}{2}$

$\therefore f^1(x)f^2(x)f^3(x) \ldots f^8(x) = \frac{1}{2} \times \frac{1}{2} \times \ldots \frac{1}{2}$ (8 times) $= \frac{1}{2^8} = \frac{1}{256}$. Hence, [3].

Correct Answer:

Time taken by you: **122 secs**

Avg Time taken by all students: **159 secs**

Your Attempt: **Skipped**

% Students got it correct: **79 %**

Answer the questions independently of each other.

$(x + 1)(y - 1) = 16$, $x > 0$, $y > 1$, then:

- $x + y \geq 16$
- $x + y \leq 16$
- $x + y \geq 8$ ✓
- $x + y \leq 8$

Congratulations, you got it correct!

01:14

Explanation:

We know that, A.M. $\geq$ G.M.

$\Rightarrow \frac{(x+1)+(y-1)}{2} \geq \sqrt{(x+1)(y-1)} \Rightarrow \frac{x+y}{2} \geq \sqrt{16}$

$\Rightarrow x + y \geq 8.$

Hence, [3].

Correct Answer:

Time taken by you: **223 secs**

Avg Time taken by all students: **117 secs**

Your Attempt: **Correct**

% Students got it correct: **66 %**

Answer the question independently of each other.

A factory employs skilled workers, unskilled workers and clerks in the proportion 8 : 5 : 1. The wages of a skilled worker, an unskilled worker and clerk are in the ratio 5 : 2 : 3. When 20 unskilled workers are employed, the total daily wages of all the workers amount to Rs. 3,180. The total daily wages paid to each category of employees are:

- Rs. 2,100, Rs. 800, Rs. 280
- Rs. 2,400, Rs. 480, Rs. 300
- Rs. 2,400, Rs. 600, Rs. 180 ✓
- Rs. 2,400, Rs. 580, Rs. 200

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

Explanation:

Skilled workers, unskilled workers and clerks are in the ratio 8 : 5 : 1.
Wages are in the ratio 5 : 2 : 3 (respectively)
$\therefore$ Total wages are in the ratio = $8 \times 5x : 5 \times 2x : 1 \times 3x$
$\Rightarrow$ 40x : 10x : 3x
$\therefore$ 40x + 10x + 3x = 3180
$\Rightarrow$ x = 60
$\therefore$ Daily wages are Rs.2400, Rs.600, Rs.180.
Hence, [3].
Alternatively,
Option [3] is the only option with wages in the ratio 40 : 10 : 3.

Correct Answer:

Time taken by you: **109 secs**

Avg Time taken by all students: **215 secs**

Your Attempt: **Correct**

% Students got it correct: **89 %**

Answer the question independently of each other.

The Simple Interest and Compound Interest (compounded annually) on a certain sum of money at the same rate of interest is Rs. 1,000 and Rs. 1,728 respectively for the fourth year. What is the rate of interest percent per annum?

- 12%
- 10%
- 15%
- 20% ✔

Congratulations, you got it correct!

Explanation:

In Compound Interest, interest is calculated on accrued interest.

∴ We consider that interest at the end of the first year i.e., Rs. 1,000 amounts to Rs. 1,728 at the end of fourth year.

Using the formula

$A = P\left(1 + \frac{R}{100}\right)^N$

$\Rightarrow 1728 = 1000\left(1 + \frac{R}{100}\right)^{4-1}$

$\Rightarrow \left(\frac{12}{10}\right)^3 = \left(1 + \frac{R}{100}\right)^{4-1}$

$\Rightarrow R = 20\%$

Hence, [4].

Correct Answer:

Time taken by you: **280 secs**

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

Your Attempt: **Correct**

% Students got it correct: **44 %**

Answer the question independently of each other.

A mutual fund gives 21% per annum compound interest. Another investment gives the same earning in 5 years under simple interest as the mutual fund gives in two years. What is the approximate rate of interest of simple interest?

- 8.4%
- 8.82%
- 9.28% ✔
- 11.61%

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

Explanation:

The mutual fund, in two years will grow by a factor of $(1.21)^2 = 1.4641$ i.e. it will give 46.41% interest.

Hence the rate of simple interest which will give the same growth in 5 years is $\frac{46.41}{5} = 9.28\%$.

Hence, [3].

Correct Answer:

Time taken by you: **62 secs**

Avg Time taken by all students: **141 secs**

Your Attempt: **Correct**

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

Answer the questions independently of each other.

The roots of the quadratic equation $ax^2 + bx + c = 0$ are m and n. Find the quadratic equation which has roots $\frac{1}{m^2}$ and $\frac{1}{n^2}$.

- $c^2x^2 - (b^2 - 2ac)x + a^2 = 0$ ✓
- $c^2x^2 - 2b^2x + a^2 = 0$
- $cx^2 - \sqrt{(b^2 - 2ac)}x + a = 0$
- None of these

Congratulations, you got it correct!

Explanation:

$$x^2 + \frac{bx}{a} + \frac{c}{a} = 0$$

$$m + n = \frac{-b}{a}$$

$$mn = \frac{c}{a}$$

$$x^2 - \left(\frac{1}{m^2} + \frac{1}{n^2}\right) x + \frac{1}{m^2} \times \frac{1}{n^2} = 0$$

$$\frac{m^2 + n^2}{m^2 \times n^2} = \frac{(m+n)^2 - 2mn}{(mn)^2}$$

$$= \frac{\frac{b^2}{a^2} - \frac{2c}{a}}{\frac{c^2}{a^2}}$$

$$\therefore x^2 - \left(\frac{b^2 - 2ac}{c^2}\right) x + \frac{a^2}{c^2} = 0$$

$\therefore c^2x^2 - (b^2 - 2ac)x + a^2 = 0$. Hence, [1].

Correct Answer:

Time taken by you: **196 secs**

Avg Time taken by all students: **132 secs**

Your Attempt: **Correct**

% Students got it correct: **76 %**

Answer the questions independently of each other.

In a One-day International match between India and Australia, 340 runs were scored by the Australians. The highest run scorer was Aaron Finch, who scored between 60-70 runs (inclusive). The remaining ten batsmen scored at least 27 runs each. What are the possible number of ways in which these runs can be scored by the Australian batsmen?

- 10^{10}
- ${}^{20}C_{10}$
- ${}^{21}C_{9}$
- ${}^{20}C_{9}$

Explanation:

Aaron Finch scores at least 60 runs and the remaining batsmen score at least 27 runs each i.e., a total of 330 runs.

Now, the remaining 10 runs (340 – 330 = 10) are scored by the 11 batsmen.

∴ The number of required possible ways is equal to the number of ways of scoring 10 runs by 11 batsmen

$= {}^{10+11-1}C_{11-1} = {}^{20}C_{10}$.

Hence, [2].

Correct Answer:

Time taken by you: **20 secs**

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

Your Attempt: **Skipped**

% Students got it correct: **41 %**

Answer the question independently of each other.

Five students are selected to participate in three different competitions such that at least one student participates in each competition. In how many different ways can all the students participate in the competitions, if no student participates in more than one competition?

- 150
- 90
- 60
- 120

Explanation:

Let the 3 competitions be A, B and C. We have to distribute 5 students over these 3 competitions ensuring that at least one student participates in each competition.
There are 2 ways of distribution:
(3, 1, 1) and (2, 2, 1)
In the first case of distribution, there are 3 arrangements possible, those are (3, 1, 1), (1, 1, 3), (1, 3, 1)
∴ The number of ways of distributing the students in each of the arrangements = ${}^5C_3 \times {}^2C_1 = 20$
∴ The number of ways in the first way of distribution = $20 \times 3 = 60$
Now, consider the second way of distribution = (2, 2, 1)
∴ There are 3 arrangements possible, those are (2, 2, 1), (2, 1, 2) and (1, 2, 2).
The number of ways of distributing the students in each of the arrangements = ${}^5C_2 \times {}^3C_2 \times {}^1C_1 = 30$
∴ The number of ways in the second way of distribution = $30 \times 3 = 90$
Total number of ways = 90 + 60 = 150. Hence, [1].

Correct Answer:

Time taken by you: **4 secs**

Avg Time taken by all students: **30 secs**

Your Attempt: **Skipped**

% Students got it correct: **17 %**

Answer the question independently of each other.

When the cost price of an article is increased by 18%, a trader increased his selling price so that he maintained the same profit percentage. If the profit he obtained was Rs. 9 more than his initial profit, then what was his initial profit?

- Rs. 36
- Rs. 45
- Rs. 50
- Cannot be Determined

Explanation:

Let CP and SP be initial cost price and selling price.

For profit percentage to be same, increase in SP = 18%

Now, 1.18(SP – CP) = 9 + (SP – CP)

∴ 0.18(SP – CP) = 9

∴ SP – CP = 50

∴ Initial profit = Rs. 50

Hence, [3].

Correct Answer:

Time taken by you: **165 secs**

Avg Time taken by all students: **116 secs**

Your Attempt: **Skipped**

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

Answer the questions independently of each other.

A piece of paper in the shape of a right angled triangle having area 24 cm^2 is cut along a line parallel to the hypotenuse of the triangle. The length of the hypotenuse of the paper that is left over after cutting is 30% less than the length of the hypotenuse of the original paper. What is the area (in cm^2) of the paper that is left over after cutting?

- 13.64
- 12.64
- 11.76
- 10.76

Explanation:

As the piece of paper is cut along a line that is parallel to hypotenuse, the triangle so formed is similar to that of the original triangle.

$$\frac{A(\text{original triangle})}{A(\text{smaller triangle})} = \frac{(\text{hypotenuse})^2}{(\text{new hypotenuse})^2}$$

$$= \frac{h^2}{(0.7 \times h)^2} = \frac{1}{0.7 \times 0.7}$$

$\therefore$ A(smaller triangle) = $24 \times 0.7 \times 0.7 = 11.76\ cm^2$

Hence, [3].

Correct Answer:

Time taken by you: **3 secs**

Avg Time taken by all students: **133 secs**

Your Attempt: **Skipped**

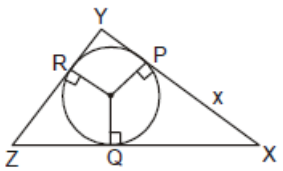
% Students got it correct: **84 %**

Answer the questions independently of each other.

A circle is inscribed in Δ XYZ, touching XY at P; XY = 7 units, YZ = 6 units, ZX = 8 units. Find XP.

- $3\frac{1}{2}$ units
- 4 units
- $4\frac{1}{2}$ units
- 3 units

Explanation:



Let XP = XQ = x

∴ ZR = ZQ = (8 − x) and YR = YP = (7 − x)

ZY = ZR + YR = (8 − x) + (7 − x) = 6

Solving this, we get

$x = 4\frac{1}{2}$ units

Hence, [3].

Correct Answer:

Time taken by you: **70 secs**

Avg Time taken by all students: **79 secs**

Your Attempt: **Skipped**

% Students got it correct: **54 %**

Answer the questions independently of each other.

The set of (a, b, c) is a set of three consecutive four digit natural numbers such that a < b < c. If ‘a’, is a square as well as a cube of a natural number, what is the remainder when the product of ‘a’, ‘b’ and ‘c’ is divided by 19?

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

Explanation:

The four-digit number which is a cube as well as a square of an integer number is $4^6 = 4096$. ($\because 3^6$ is a three-digit number and 5^6 is a five-digit number.)
(4096 is the square of 64 and the cube of 16)
Now, the three numbers are 4096, 4097 and 4098. We need to find the remainder when
4096 × 4097 × 4098 is divided by 19.
4096 × 4097 × 4098 = (19 × 215 + 11) × (19 × 215 + 12) × (19 × 215 + 13)
$\therefore$ The required remainder can be found by dividing

$11 \times 12 \times 13$ by $19 = \frac{1716}{19} = 90\frac{6}{19}$.

Therefore, the required answer is 6.

Correct Answer:

Time taken by you: **4 secs**

Avg Time taken by all students: **75 secs**

Your Attempt: **Skipped**

% Students got it correct: **34 %**

Answer the question independently of each other.

Of the 5 pipes connected to a tank, some are inlet pipes and the rest are outlet pipes. Each inlet pipe can completely fill a tank in 8 hours and each outlet pipe can completely empty a tank in 4 hours. The tank is initially empty, when all the pipes are simultaneously opened and it was observed that the tank was full in 4 hours. How many outlet pipes are connected to the tank?

- 4
- 3
- 1 ✓
- 2

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

Explanation:

Let the number of inlet pipes = x

And the number of outlet pipes = y

Amount of work done by x pipes in 1 hour = $\frac{x}{8}$

And amount of work done by y pipes in 1 hour = $\frac{y}{4}$

$\therefore \frac{x}{8} - \frac{y}{4} = \frac{1}{4} \Rightarrow x - 2y = 2$

And we have x + y = 5

Solving these equations, we get

x = 4, y = 1

Hence, [3].

Correct Answer:

Time taken by you: **116 secs**

Avg Time taken by all students: **130 secs**

Your Attempt: **Correct**

% Students got it correct: **77 %**

Answer the questions independently of each other.

Consider the set of all two or more digit natural numbers such that no digit in any number is repeated. (e.g., 133 would not be a member because 3 is repeated).

Of all the numbers in the given set, how many numbers have at the most, five digits?

- 27216
- 32481
- 31752
- 28674

Explanation:

Required number = 9 × 9 + 9 × 9 × 8 + 9 × 9 × 8 × 7 + 9 × 9 × 8 × 7 × 6

= 9 × 9(1 + 8 + 8 × 7 + 8 × 7 × 6)

= 9 × 9 × 401 = 401 × 81 = 32481

Hence, [2].

Correct Answer:

Time taken by you: **17 secs**

Avg Time taken by all students: **104 secs**

Your Attempt: **Skipped**

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

Answer the questions independently of each other.

Find the value of $\log_{\sqrt{2}}4 + \log_{\sqrt{3}}9 + \log_{\sqrt{4}}16 + \log_{\sqrt{5}}25$+... (n terms)?

- n^2
- 2n
- 4n ✓
- $n\sqrt{n}$

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

Explanation:

Consider, $\log_{\sqrt{2}}4 = \log_{\sqrt{2}}2^2 + 2\log_{\sqrt{2}}2 = 2 \times 2 = 4$
Also, $\log_{\sqrt{3}}9 = \log_{\sqrt{3}}3^2 = 2\log_{\sqrt{3}}3 = 2 \times 2 = 4$.
Thus, each term is equal to 4.
Therefore the sum of the 'n' terms = 4n.
Hence, [3].

Correct Answer:

Time taken by you: **54 secs**

Avg Time taken by all students: **81 secs**

Your Attempt: **Correct**

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

Answer the question independently of each other.

Given that $x^2 \leq 1$, $|y - 1| \geq 3$ and $-2 \leq z \leq -1$, which of the following statements is necessarily true?

- $|xy + 1| \geq 2$
- $|yz + 1| \geq 4$
- $|xz - 1| \leq 1$
- $|yz| + 1 \geq 3$ ✔

Congratulations, you got it correct!

Explanation:

From the given information:

$x^2 \leq 1 \Rightarrow -1 \leq x \leq 1$;

$|y - 1| \geq 3 \Rightarrow y \geq 4$ or $y \leq -2$ and

$-2 \leq z \leq -1$

Evaluating the options:

For $x = 0$, $|xy + 1| = 1 < 2$ [1] is false.

Now, $yz \leq -4$ or $yz \geq 2$

$\therefore yz + 1 \leq -3$ or $yz + 1 \geq 3$

$\therefore |yz + 1| \geq 3$. [2] is not necessarily true.

Also, $-2 \leq xz \leq 2$

$\therefore -3 \leq xz - 1 \leq 1$

$\therefore |xz - 1| \leq 3$. [3] is not necessarily true.

$yz \leq -4$ or $yz \geq 2 \Rightarrow 2 \leq |yz|$

$\therefore |yz| + 1 \geq 3$. [4] is true. Hence, [4].

Correct Answer:

Time taken by you: **189 secs**

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

Your Attempt: **Correct**

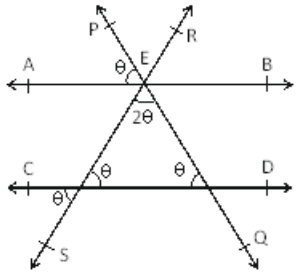
% Students got it correct: **58 %**

Answer the questions independently of each other.

AB and CD are two parallel lines. PQ cuts the lines AB and CD at points E and G respectively. RS cuts the lines AB and CD at points E and F respectively. The ratio of measures of ∠PEA, ∠CFS and ∠FEG is 1 : 1 : 2. If ℓ (GF) = $\sqrt{2}$ cm then what is the length of GE?

- $\frac{3}{4}$ cm
- $\frac{1}{2}$ cm
- 2 cm
- 1 cm

Explanation:



Let m∠PEA = θ = m∠CFS and m∠FEG = 2θ
m∠PEA = θ ⇒ m∠EGA = θ
m∠CFS = θ ⇒ m∠EFG = θ
Consider ΔEFG.
2θ + θ + θ = 180 ⇒ θ = 45
∴ Δ EFG is right triangle and m∠FEG = 90°
As GF = $(2)^{0.5}$ cm, EF = EG = 1 cm
Hence, [4].

Correct Answer:

Time taken by you: **6 secs**

Avg Time taken by all students: **149 secs**

Your Attempt: **Skipped**

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

Answer the question independently of each other.

Suppose α and β are the roots of a quadratic equation such that their sum is 12 and their product is 32. A cubic equation $x^3 + ax^2 + bx + c = 0$ has α, β and (α + β) as its three roots. What is the value of 'c'?

- –176
- 176
- –384 ✓
- 384

 Congratulations, you got it correct!

01:29

Explanation:

Let the roots of the quadratic equation be ‘α’ and ‘β’.

Then (α + β) = 12 and αβ = 32

Solving, we have α = 8 and β = 4.

The roots of the cubic equation are 8, 4 and 12 i.e., the cubic equation can be written as, (x – 8)(x – 4)(x – 12) = 0

∴ The constant term of the cubic equation is

$(-1)^3(8 \times 4 \times 12) = -384$.

Hence, [3].

Correct Answer:

Time taken by you: **97 secs**

Avg Time taken by all students: **93 secs**

Your Attempt: **Correct**

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

Answer the question independently of each other.

A boy walked along the diameter AB of a semicircular playground. Had he walked along the circumference, he would have taken 48 second more. If he walked at the rate of 50 m per minute, what was the diameter of the playground?

- (●) 70 m ✔
- ( ) 54 m
- ( ) 85 m
- ( ) 35 m

Congratulations, you got it correct!

Explanation:

Let 'd' be the diameter (AB) of the playground.

$\therefore$ The distance that the boy covered while walking along the semicircular path from

A to B $= \frac{\pi d}{2} = \frac{11}{7}d$

Now, the distance covered in 48 seconds at 50 m per minute = 40 m.

$\frac{11}{7}d - d = 40 \Rightarrow \frac{4}{7}d = 40 \Rightarrow d = 70$ m

Hence, [1].

Correct Answer:

Time taken by you: **213 secs**

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

Your Attempt: **Correct**

% Students got it correct: **69 %**

Answer the questions independently of each other.

Given that θ is an angle between 180° and 270°, what is the value of θ if it satisfies the equation $3\cos^2 \theta - \sin^2 \theta = 2$?

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

180 ^{o}

Oops, you got it wrong!

Explanation:

$3\cos^2\theta - \sin^2\theta = 2$

$3\cos^2\theta - (1 - \cos^2\theta) = 2$

$4\cos^2\theta = 3$

$\cos\theta = \pm\frac{\sqrt{3}}{2} \Rightarrow \cos\theta = 30° \text{ or } 210°$

Therefore, the required answer is 210.

Correct Answer:

Time taken by you: **103 secs**

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

Your Attempt: **Wrong**

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

Answer the questions independently of each other.

Rohit drops a ball vertically from the top of a 50 m high building. The ball bounces repeatedly, and goes up to a height which is $\left(\frac{2}{3}\right)^{rd}$ of the previous bounce.

What is the total distance travelled by the ball before coming to rest?

Specify the distance in meters

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

Explanation:

The distances travelled by the ball during each bounce is in Geometric Progression with $r = \frac{2}{3}$.

Sum upto infinity is $\frac{a}{1-r}$.

Here, except for the first 50 m, all the distances are travelled twice. Hence, total distance is,

$$= 2\left(\frac{50}{1-\frac{2}{3}}\right) - 50 = 300 - 50 = 250 \text{ m}.$$

Therefore, the required answer is 250.

Correct Answer:

Time taken by you: **40 secs**

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

Your Attempt: **Skipped**

% Students got it correct: **47 %**

Answer the questions independently of each other.

A box contains 6 white balls and 3 black balls, and another box contains 4 white balls and 5 black balls. What is the probability that a ball selected from one of the box at random is a white ball?

- $\frac{5}{9}$
- $\frac{6}{18}$
- $\frac{4}{18}$
- $\frac{9}{10}$

Explanation:

Probability of selecting any bag is $\frac{1}{2}$.

Probability of getting a white ball will be $= \frac{1}{2}\times\frac{{}^{6}C_{1}}{{}^{9}C_{1}}+\frac{1}{2}\times\frac{{}^{4}C_{1}}{{}^{9}C_{1}}=\frac{5}{9}$.

Hence, [1].

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **169 secs**

Your Attempt: **Skipped**

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