

Given $\tan 36^\circ$ is approximately equal to 0.7265, which of the following is closest to the area of a regular pentagon with side 2 cm (in sq. cm?)

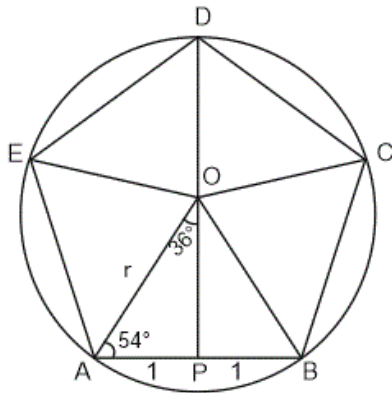
- ☒ 6.88 ✓
- ☐ 7.32
- ☐ 5.48
- ☐ More information is needed to answer the question



Congratulations, you got it correct!

Explanation:

Suppose the pentagon has been inscribed in a circle with center O and radius ' r ' as shown.



Join the center of the circle with all the vertices of the pentagon. Drop perpendicular from O to AB meeting AB at P , as shown. Each side of the pentagon = 2 cm. Therefore, $AP = PB = 1$ cm. Since each internal angle of a regular pentagon is 108° , we get $m\angle OAP = 54^\circ$ and $m\angle AOP$

$= 90 - 54 = 36^\circ$, as shown.

Area of the pentagon = $5 \times (\text{Area of } \triangle AOP)$

Correct Answer:

Time taken by you: **221 secs**

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

Your Attempt: **Correct**

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

Gaurav has two boxes (named box A and B) with him. Both the boxes contain a number of distinct red and blue pens. The number of ways he can select two red pens from box A is 91. Similarly the number of ways he can select one red pen from each of the two boxes is 532 and the number of ways he can select one blue pen from each of the two boxes is 253. If he can select one red pen and one blue pen from box A in 322 ways, in how many ways can he select two pens (both can be red or blue or one can be of either color) from the total number of pens he has in the two boxes?

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

Explanation:

Let there be 'x' red pens in box A and 'y' red pens in box B.

Number of ways of selecting one red pen from box A and other from box B = $x \times y = 532$

Number of ways of selecting two red pens from box A = ${}^x C_2 = 91$

$$\therefore x = 14$$

$$14 \times y = 532 \Rightarrow y = 38$$

Let there be 'm' blue pens in box A and 'n' blue pens in box B.

$$\therefore m \times n = 253 \text{ and } m \times 14 = 322$$

$$\Rightarrow m = 23 \text{ and } n = 11$$

Total pens in box A = $23 + 14 = 37$ and that in box B = $11 + 38 = 49$ Total number of pens in both the boxes = $37 + 49 = 86$

Thus, Gaurav can select two pens from $37 + 49 = 86$ pens in ${}^{86} C_2 = 3655$

Therefore, the required answer is 3655.

Correct Answer:

Time taken by you: **2 secs**

Avg Time taken by all students: **99 secs**

Your Attempt: **Skipped**

% Students got it correct: **37 %**

A alone takes 40 days to finish a certain work. B and C individually take equal time to finish the same work. B and C started working together and finished 12.5% of the work. After this A joined them and working together they finished the work in 7 more days. In how many days can B alone finish the work?

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

 days

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

Explanation:

12.5% is nothing but $\frac{1}{8}$ of the total work. As that much work is already done, $\frac{7}{8}$ work is remained.

Let, the work = 1 and B and C each take 'x' days to finish the entire work.

So, in a day, B and C can do $\frac{1}{x}$ of the work whereas in one day A does $\frac{1}{40}$ of the work.

According to given data, $\left(\frac{1}{40} + \frac{1}{x} + \frac{1}{x}\right) \times 7 = \frac{7}{8}$

$\Rightarrow 80 + x = 5x \Rightarrow 4x = 80 \Rightarrow x = 20$ days.

Therefore, the required answer is 20.

Correct Answer:

Time taken by you: **92 secs**

Avg Time taken by all students: **146 secs**

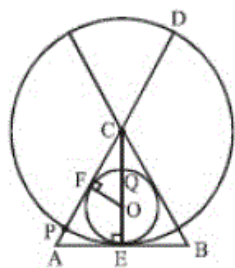
Your Attempt: **Correct**

% Students got it correct: **72 %**

Two circles are drawn in such a way that the smaller circle touches the bigger circle internally. $\triangle ABC$ is drawn in such a way that it circumscribes the smaller circle. The two sides AC and BC of $\triangle ABC$ intersect each other at the centre of the bigger circle, while the third side is tangent to both the circles. Side AC is extended to touch the bigger circle at D[A, C and D are in a straight line] and AD = 18 cm. If the radius of the bigger circle is 8 cm, then find the radius of the smaller circle.

- ☐ 3 cm
- ☐ $2\sqrt{2}$ cm
- ☐ $\frac{3}{\sqrt{2}}$ cm
- ☐ Cannot be determined

Explanation:



Given, $AD = 18$ cm and $PD = 2 \times 8 = 16$ cm

$\Rightarrow AP = 2$ cm

Then by tangent-secant theorem, $AE^2 = AD \times AP$

$\Rightarrow AE^2 = 18 \times 2 = 36 \Rightarrow AE = 6$ cm

Since, AF and AE are the tangents to the smaller circle from the same point, A,

$AF = AE = 6$ cm

$AC = AP + PC = 2 + 8 = 10$ cm

Correct Answer:

Time taken by you: **1 secs**

Avg Time taken by all students: **148 secs**

Your Attempt: **Skipped**

% Students got it correct: **48 %**

If $k = (2.1! + 6.3! + 10.5! + 14.7! + 18.9! + 22.11!)$ and $n = (1! - 2.2! + 3.3! - 4.4! \dots - 10.10!)$, then find the remainder when $(n + 23.11!)$ is divided by 'k'.

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

Explanation:

$$n = 1! - 2.2! + 3.3! - 4.4! + 5.5! - 6.6! + 7.7! - 8.8! + 9.9! - 10.10!$$

$$= 1! - (3! - 2!) + (4! - 3!) - (5! - 4!) + (6! - 5!) - \dots - (11! - 10!)$$

$$= 1! + 2! + 2(4! - 3!) + 2(6! - 5!) + 2(8! - 7!) + 2(10! - 9!) - 11!$$

$$= 1! + 2! + 6.3! + 10.5! + 14.7! + 18.9! - 11!$$

$$\therefore n + 23.11! = 1 + k$$

\therefore The remainder is 1.

Correct Answer:

Time taken by you: 5 secs

Avg Time taken by all students: 37 secs

Your Attempt: Skipped

% Students got it correct: 31 %

Find the number of non-negative integer solutions for $xy = 8x - 10y$.

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



Oops, you got it wrong!

Explanation:

$$\begin{aligned}xy &= 8x - 10y \\ \therefore xy - 8x + 10y &= 0 \\ \therefore xy - 8x + 10y - 80 &= -80 \\ \therefore (x + 10)(y - 8) &= -80\end{aligned}$$

Now, if 'x' is non-negative, (x + 10) also will be non-negative. So, for the product to be negative, (y - 8) should be negative. So, 'y' has to be non-negative but less than 8. The simplest approach at this point would be to check these possible values of 'y' and see for which ones $\frac{-80}{y - 8}$ becomes a natural number. It turns out the only possible value of 'y' are 0, 3, 4, 6 and 7 (corresponding values for x are 0, 6, 10, 30 and 70). This gives us 5 possible non-negative integer solutions.

Therefore, the required answer is 5.

Correct Answer:

Time taken by you: **258 secs**

Avg Time taken by all students: **34 secs**

Your Attempt: **Wrong**

% Students got it correct: **16 %**

How many of the sets $T_n = \{n, n + 2, n + 3, n + 5, n + 7\}$, where n is a whole number less than or equal to 50, contain at least two prime numbers?

- ☐ 21
- ☐ 22
- ☒ 25 ❌
- ☐ More than 30



Oops, you got it wrong!



Explanation:



By checking various possibilities, we find that T_n will have 2 or more prime numbers for $n = 0, 2, 3, 4, 5, 6, 8, 10, 11, 12, 14, 16, 17, 24, 26, 29, 34, 36, 38, 40$ or 41 .

\therefore The number of sets satisfying the given condition = 21. Hence, [1].

Correct Answer:



Time taken by you: **391 secs**

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

Your Attempt: **Wrong**

% Students got it correct: **28 %**

A man standing at the bottom of a staircase starts tossing a coin. Every time it shows Heads, he climbs two steps, while every time it shows Tails he climbs one step. After a while, he finds that he has climbed 8 steps. How many possible sequences of Heads and Tails could he have thrown?

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



Explanation:



The man could have climbed 8 steps by tossing 8 Tails (1 way), or 6 Tails and 1 Head (${}^7C_1 = 7$ ways) or 4 Tails and 2 Heads (${}^6C_2 = 15$ ways) or 2 Tails and 3 Heads (${}^5C_3 = 10$ ways) or 4 Heads (1 way), leading to a total of 34 possible sequences in all.

Therefore, the required answer is 34.

Correct Answer:



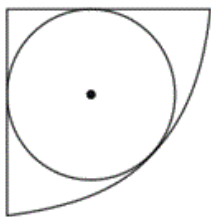
Time taken by you: **39 secs**

Avg Time taken by all students: **49 secs**

Your Attempt: **Skipped**

% Students got it correct: **26 %**

A quarter circle with radius 4 cm has a circle inscribed in it as shown in the figure. Find the diameter of the circle.



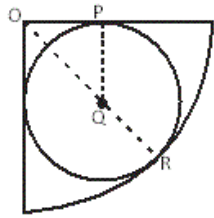
- ☐ $\frac{2}{1 + \sqrt{2}}$ cm
- ☒ $\frac{8}{1 + \sqrt{2}}$ cm ✓
- ☐ $\frac{4}{1 + \sqrt{2}}$ cm
- ☐ $\frac{4\sqrt{2}}{1 + \sqrt{2}}$ cm



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

Explanation:

The radius of the quarter circle is 4 cm.



Let the radius of circle be r cm.
 $\triangle PQO$ is a 45° - 45° - 90° triangle.

$$\ell(PQ) = \ell(PQ) = r \text{ cm}$$

$$\therefore \ell(OQ) = r\sqrt{2} \text{ cm}$$

$$\therefore \ell(OR) = \ell(OQ) + \ell(QR)$$

$$4 = r\sqrt{2} + r$$

$$r = \frac{4}{\sqrt{2} + 1}$$

8

Correct Answer:

Time taken by you: **61 secs**

Avg Time taken by all students: **98 secs**

Your Attempt: **Correct**

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

A student got as many marks in Physics as he got in Mathematics. The ratio of his marks in Biology and Chemistry was 5 : 7. The ratio of his marks in Biology and Mathematics is 3 : 2. If he gets an aggregate of 64% in all the four papers and each subject had equal maximum marks, in how many subjects has he scored more than 50% marks?

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:

Let the marks in the subjects be P, M, B and C respectively.

Assuming maximum marks per subject to be 100.

$$\therefore B : C = 5 : 7$$

$$P : M = 1 : 1 \text{ and } B : M = 3 : 2$$

$$\therefore B : M : C = 15 : 10 : 21$$

$$\text{And } P : B : M : C = 10 : 15 : 10 : 21$$

$$\text{Let } P = 10x = M$$

$$\text{Therefore, } B = 15x \text{ and } C = 21x$$

$$\therefore \text{Average marks} = \frac{10x + 10x + 15x + 21x}{4} = \frac{56x}{4} = 14x$$

$$\therefore 14x = 64$$

$$\therefore x = \frac{64}{14} = \frac{32}{7} \approx 4.57$$

$$\therefore 10x \approx 45, 15x \approx 68.57 \text{ and } 21x \approx 96$$

Thus, the student has scored more than 50% in 2 subjects.

Therefore, the required answer is 2.

Correct Answer:

Time taken by you: **124 secs**

Avg Time taken by all students: **200 secs**

Your Attempt: **Correct**

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

Let $u = (\log_2 x)^2 - 6\log_2 x + 12$, where x is a real number. The equation $x^u = 256$, has:

- ☐ no solution for x .
- ☒ exactly one solution for x . ✓
- ☐ exactly 2 distinct solutions for x .
- ☐ exactly 3 distinct solutions for x .



Congratulations, you got it correct!

Explanation:

$$x^u = 256$$

$$\text{i.e., } x^u = 2^8$$

Taking log on both sides, we get, $u \log x = 8 \log 2$

$$\frac{\log x}{\log 2} = \frac{8}{u}$$

$$\log_2 x = \frac{8}{u}$$

Substituting this in the logarithmic equation, we get,

$$u = \left(\frac{8}{u}\right)^2 - 6\left(\frac{8}{u}\right) + 12$$

$$u = \frac{64}{u^2} - \frac{48}{u} + 12$$

$$u^3 = 64 - 48u + 12u^2$$

$$u^3 - 12u^2 + 48u - 64 = 0$$

$$(u-4)^3 = 0 \Rightarrow u = 4$$

\therefore We have a unique value of u.

Now, $x^4 = 256 \Rightarrow x = \pm 4$ and $\pm 4i$

Correct Answer:

Time taken by you: **127 secs**

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

Your Attempt: **Correct**

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

The average age of a family of four (father, mother, daughter and son) is 36.25. Five years ago, the ratio of age of the daughter to that of the mother was 1 : 3. Ten years ago, the ratio of age of the son to that of the father was 1 : 10. Find the present age of the father. (Assume only integral values for the ages and that daughter and son cannot be older than their father and mother.)

- ☐ 100 years
- ☒ 60 years ✓
- ☐ 50 years
- ☐ 80 years



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

Explanation:

Let the present age of the daughter the mother be ' $k_1 + 5$ ' and ' $3k_1 + 5$ ' years respectively and the present age of the son and father be ' $k_2 + 10$ ' and ' $10k_2 + 10$ ' years respectively.

According to given data,

$$\therefore (k_1 + 5) + (3k_1 + 5) + (k_2 + 10) + (10k_2 + 10) = 36.25 \times 4 = 145$$

$$\Rightarrow 4k_1 + 11k_2 = 115$$

Since we are to assume only integral values the possible cases are $(k_1, k_2) = (26, 1), (15, 5)$ and $(4, 9)$.

$(26, 1)$ is not possible because daughter's age becomes more than the father's age and similarly $(4, 9)$ is not possible because the son's age becomes more than the mother's age hence $k_1 = 15$ & $k_2 = 5$

$$\therefore \text{Father's age} = k_2 \times 10 + 10 = 50 + 10 = 60 \text{ years.}$$

Hence, [2].

Correct Answer:

Time taken by you: **122 secs**

Avg Time taken by all students: **205 secs**

Your Attempt: **Correct**

% Students got it correct: **67 %**

At how many points do the graphs of the functions $y = 2 \log x$ and $y = \log 2x$ intersect?

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



Oops, you got it wrong!

Explanation:

For the graphs to intersect, we must have $2 \log x = \log 2x$, i.e. $\log x^2 = \log 2x$,

$$\text{i.e. } x^2 = 2x$$

Note that the graph of $\log x$ is defined only for $x > 0$

So, $x^2 = 2x$. Therefore, $x = 2$

So the graphs intersect at exactly one point $(2, \log 4)$

Therefore, the required answer is 1.

Correct Answer:

Time taken by you: **34 secs**

Avg Time taken by all students: **62 secs**

Your Attempt: **Wrong**

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

For all non-negative real 'x', the functions $f(x)$, $g(x)$ and $h(x)$ are defined as follows:

$$f(x) = \sqrt{x-3}$$

$$g(x) = x^2 + 2x + 4$$

$$h(x) = x + 2$$

Also $f \circ f(x)$ is defined as $f(f(x))$, $f \circ f \circ f(x)$ is defined as $f(f(f(x)))$ and so on.

Find the value of $f \circ g \circ h \circ f \circ g \circ h \circ f \circ g \circ h(2019)$.

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

Explanation:

Since $f(x) = \sqrt{x - 3}$, $g(x) = x^2 + 2x + 4$ and $h(x) = x + 2$

$goh(x) = g(x + 2) = (x + 2)^2 + 2(x + 2) + 4 = x^2 + 6x + 12$

and $fogoh(x) = f(x^2 + 6x + 12) = \sqrt{x^2 + 6x + 12 - 3} = \sqrt{x^2 + 6x + 9} = x + 3$

So, $fogoh(2019) = 2019 + 3 = 2022$

$fogohofogoh(2019) = fogoh(2022) = 2022 + 3 = 2025$

$fogohofogohofogoh(2019) = fogoh(2025) = 2025 + 3 = 2028$

Therefore, the required answer is 2028.

Correct Answer:

Time taken by you: **55 secs**

Avg Time taken by all students: **112 secs**

Your Attempt: **Skipped**

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

In all 3 seniors complete as much work in equal time as 2 juniors and 6 trainees together. Similarly 12 seniors complete as much work in equal time as 10 juniors and 20 trainees together. If 2 seniors, 3 juniors and 4 trainees together complete a piece of work in 6 days, how many days will 9 juniors and 2 trainees take to complete the same piece of work?

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



Congratulations, you got it correct!

Explanation:

Suppose the number of units of work completed by a senior, junior and a trainee in one day be S, J and T respectively.

We have the following

$$3S = 2J + 6T \text{ and } 12S = 10J + 20T.$$

Solving these two equations, we get $J = 2T$. Since $3S = 2J + 6T$, we get $S = \frac{10}{3}T$

If $T = 3$, $J = 6$ and $S = 10$.

Given: 2 seniors, 3 juniors and 4 trainees complete a piece of work in 6 days. Therefore, total quantum of work to be done = $6(2 \times 10 + 3 \times 6 + 4 \times 3) = 300$ units.

Total quantum of work done by 9 juniors and 2 trainees in one day = $9 \times 6 + 2 \times 3 = 60$ units.

\therefore The number of days taken by 9 juniors and 2 trainees to complete the work = $\frac{300}{60} = 5$

Therefore, the required answer is 5.

Correct Answer:

Time taken by you: **182 secs**

Avg Time taken by all students: **142 secs**

Your Attempt: **Correct**

% Students got it correct: **55 %**

Two friends invested Rs. 1,00,000 in two different schemes for the same time period. One invested his amount in Kisan Vikas Patra(KVP) at 8% per annum compounded annually. The other invested in Term Deposits with some bank where the rate of interest (compounded annually) for the first two years was 7% per annum, for the next two years was 7.5% per annum and from 5th year onward, 8% per annum. Find the approximate difference between their returns at the end of 60 months.

- ☒ Rs. 4,040 ✓
- ☐ Rs. 4,946
- ☐ Rs. 5,082
- ☐ Rs. 5,248



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

Explanation:

Investment in KVP would yield : $100000 \times (1.08)^5 \approx 1,46,932$

Investment in the bank would yield : $100000 \times (1.07)^2(1.075)^2(1.08) \approx 1,42,892$

\therefore The required difference \approx Rs. 4,040

Hence, [1].

Correct Answer:

Time taken by you: **60 secs**

Avg Time taken by all students: **250 secs**

Your Attempt: **Correct**

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

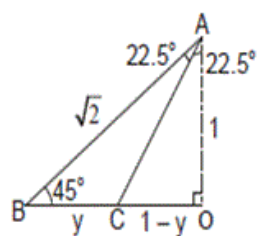
Two cyclists Ram and Lakhan simultaneously start cycling towards a point C from points A and B respectively such that $m\angle ABC = 45^\circ$ and $m\angle BAC = 22.5^\circ$. Which of the following is the closest ratio of Ram's speed to Lakhan's speed, if they reach point C together?

- ☐ 19 : 20
- ☒ 11 : 6 ✓
- ☐ 3 : 2
- ☐ 5 : 3



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

Explanation:



Let O be a point outside $\triangle ABC$ such that $\triangle AOB$ is 45° - 45° - 90° triangle and B-C-O.
Let $AO = BO = 1$, $BC = y$, $OC = 1 - y$.

By angle bisector theorem, $\frac{1-y}{y} = \frac{1}{\sqrt{2}}$

$$\Rightarrow \frac{1}{y} = \frac{1+\sqrt{2}}{\sqrt{2}} \Rightarrow y = \frac{\sqrt{2}}{1+\sqrt{2}} = \frac{\sqrt{2}}{1+\sqrt{2}} \times \frac{\sqrt{2}-1}{\sqrt{2}-1} = 2 - \sqrt{2}$$

$$\therefore 1 - y = \sqrt{2} - 1$$

$$\therefore AC = \sqrt{(1-y)^2 + 1} = \sqrt{(\sqrt{2}-1)^2 + 1} = \sqrt{4 - 2\sqrt{2}} = \sqrt{2}\sqrt{2 - \sqrt{2}}$$

Correct Answer:

Time taken by you: **94 secs**

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

Your Attempt: **Correct**

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

If $a, b > 1$, which of the following options about $N = (\log_a ab)(\log_b ab)$ can be correct?

- ☐ $1 \leq N < 2$
- ☐ $2 \leq N < 3$
- ☐ $3 \leq N < 4$
- ☒ $4 \leq N < 5$ ✓



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

Explanation:

$$N = (\log_a ab) (\log_b ab)$$

$$\therefore N = \frac{\log ab}{\log a} \times \frac{\log ab}{\log b}$$

$$\therefore N = \frac{\log a + \log b}{\log a} \times \frac{\log a + \log b}{\log b}$$

$$\therefore N = \left(1 + \frac{\log b}{\log a}\right) \left(1 + \frac{\log a}{\log b}\right)$$

$$\therefore N = 1 + \frac{\log b}{\log a} + \frac{\log b}{\log a} + \left(\frac{\log b}{\log a}\right) \left(\frac{\log a}{\log b}\right)$$

$$\therefore N = 2 + \frac{\log b}{\log a} + \frac{\log a}{\log b}$$

Now, $\frac{\log b}{\log a}$ and $\frac{\log a}{\log b}$ are reciprocals of each other.

Since $a, b > 1$, both $\frac{\log b}{\log a}$ and $\frac{\log a}{\log b}$ are positive.

Therefore the minimum value of $\frac{\log b}{\log a} + \frac{\log a}{\log b}$ is 2.

Correct Answer:

Time taken by you: **41 secs**

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

Your Attempt: **Correct**

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

What values of x satisfy $x^{\frac{1}{2}} - 5x^{\frac{1}{4}} + 6 < 0$?

- ☐ $16 \leq x \leq 81$
- ☒ $16 < x < 81$ ✓
- ☐ $2 < x < 3$
- ☐ $2 \leq x < 3$



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

Explanation:

Let $x^{\frac{1}{4}} = y$

\therefore The given equation becomes,

$$y^2 - 5y + 6 < 0$$

$$\text{i.e., } (y - 3)(y - 2) < 0 \text{ i.e., } 2 < y < 3$$

$$\text{i.e., } 2 < x^{\frac{1}{4}} < 3$$

$$\text{i.e., } 16 < x < 81$$

Hence, $[2]$.

Correct Answer:

Time taken by you: **43 secs**Avg Time taken by all students: **101 secs**Your Attempt: **Correct**% Students got it correct: **82 %**

According to a new scheme, a mobile network company offers a few free calls to its customers every month. Every subsequent call, after the free calls, is charged at a fixed rate. Garima paid Rs. 1,300 for 850 calls in the month of May, and Rs. 800 for 600 calls in the month of June. What amount will she have to pay if she makes a total of 1450 calls in July?

- ☒ Rs. 2,100 ❌
- ☐ Rs. 2,350
- ☐ Rs. 2,500
- ☐ None of these



Oops, you got it wrong!

Explanation:

Let the number of free calls be x .

Let the subsequent calls be charged at Rs. y per call.

$$\therefore (850 - x)y = 1300 \quad \dots (i)$$

$$\text{and } (600 - x)y = 800 \quad \dots (ii)$$

Subtracting (ii) from (i) we get, $y = 2$

$$\therefore x = 200.$$

\therefore The charge for 1450 calls

$$= (1450 - 200) \times 2 = \text{Rs. } 2,500$$

Hence, [3].

Correct Answer:

Time taken by you: **206 secs**

Avg Time taken by all students: **139 secs**

Your Attempt: **Wrong**

% Students got it correct: **72 %**

X_1, X_2, X_3, X_4, X_5 and X_6 are natural numbers such that $X_1 < X_2 < X_3 < X_4 < X_5 < X_6$. The difference between two consecutive numbers is given by a, b, c, d and e respectively.

If $a + b + c + d + e = N$ has 126 distinct integer solutions, find N .

- ☐ 10
- ☐ 9
- ☐ 8
- ☒ 7 ❌



Oops, you got it wrong!

Explanation:

As $X1 < X2 < X3 < X4 < X5 < X6$, a, b, c, d and e are natural numbers.

Therefore, number of distinct integer solutions = ${}^{(N-1)}C_{(5-1)} = 126$

Substituting values from options, we get N = 10

Hence, [1].

Correct Answer:

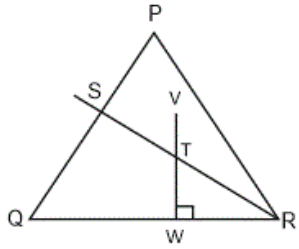
Time taken by you: **157 secs**

Avg Time taken by all students: **84 secs**

Your Attempt: **Wrong**

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

In the given figure, RS is an altitude in $\triangle PQR$. Through T, the midpoint of RS, line segment VW is drawn perpendicular to QR. If $m\angle VTS$ is 55° find $m\angle PQR$.



- ☒ 55° ✓
- ☐ 35°
- ☐ 62.5°
- ☐ None of these

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

Explanation:

If $m\angle VTS = 55^\circ$, $m\angle WTS = 125^\circ$ (linear pair). Now in quadrilateral QSTW, the three angles at S, T and W are known to be 90° , 125° and 90° respectively.

So, the fourth angle at Q i.e., $m\angle PQR = 360 - (90 + 125 + 90) = 55^\circ$.
Hence, [1].

Correct Answer:

Time taken by you: **86 secs**

Avg Time taken by all students: **139 secs**

Your Attempt: **Correct**

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

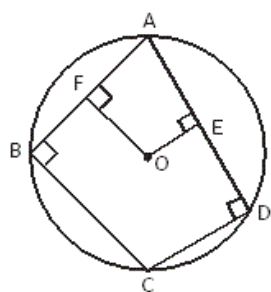
AC is a diameter of the circle with center O. OE and OF are perpendicular to AD and AB respectively such that A-F-B and A-E-D. If perimeter of cyclic □ABCD is 'P' units, then what will be the perimeter of □AEOF?

- ☒ $\frac{P}{3}$ units ✖
- ☐ $\frac{2P}{3}$ units
- ☐ $\frac{P}{2}$ units
- ☐ $\frac{\sqrt{3}}{2} P$ units



Oops, you got it wrong!

Explanation:



Since, AC is a diameter, $CD \perp AD$ and $CB \perp AB$.

\therefore In $\triangle ACD$, $OE = \frac{1}{2} CD$ and in $\triangle ACB$, $OF = \frac{1}{2} BC$ (by converse of midpoint theorem)

Now, OE and OF are the perpendiculars drawn from centre on segments AD and AB, respectively, hence they bisect AD and AB at E and F, respectively.

$$\therefore AE = \frac{1}{2} AD \text{ and } AF = \frac{1}{2} AB$$

$$\therefore \text{Perimeter of } \square AEOF = AE + OE + OF + AF$$

$$= \frac{1}{2} (AD + CD + BC + AB) = \frac{1}{2} P$$

Correct Answer:

Time taken by you: 273 secs

Avg Time taken by all students: 154 secs

Your Attempt: Wrong

% Students got it correct: 82 %

In a tennis match, two players play against each other in a game that lasts for minimum three and maximum five ‘sets’. The match ends when one of the players wins 3 sets and that player is designated as the winner of the match. The final of a tennis tournament named ‘US Open’ was played between Nadal and Medvedev at New York. How many outcomes can the tennis match have in terms of the number of sets won by either player?

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

Explanation:

Suppose we denote the winner of the match by 'W' and the loser by 'L'.

Case 1: If the match is over in three sets

In that case, there is only possible outcome i.e. all the three sets are won by 'W'.

Case 2: If the match is over in four sets

The fourth set must be won by 'W'. Out of the first three sets, two are won by 'W' and one set is won by 'L'. We can have $\frac{3!}{2!1!} = 3$ different outcomes for this.

Case 3: If the match is over in five sets

The fifth set must be won by 'W'. Out of the first four sets, two sets are won by 'W' and 'L' each.

We can have $\frac{4!}{2!2!} = 6$ different outcomes for this.

Therefore, the total number of outcomes = $1 + 3 + 6 = 10$. We can select the pair of 'W' and 'L' in two different ways. Thus, total number of ways = $10 \times 2 = 20$

Therefore, the required answer is 20.

Correct Answer:

Time taken by you: 9 secs

Avg Time taken by all students: 12 secs

Your Attempt: Skipped

% Students got it correct: 8 %

Witty and Chitty together want to purchase a toy costing Rs. 10 through a machine which accepts notes of denominations - Re. 1, Rs. 2, Rs. 5, Rs. 10, but notes of exactly two different denominations at a time and never gives back money that is extra. Witty decides to pay an even number of notes and both pay notes of different denominations. Both Witty and Chitty contribute certain amount for the purchase of the toy. In how many ways can they buy the toy if they pay the exact cost?

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

Explanation:

When Chitty pays Re.1 note/s, then Witty can pay

Chitty	Witty
Re. 1×2	Rs. 2×4
Re. 1×6	Rs. 2×2

When Chitty pays Rs. 2 note/s

Chitty	Witty
Rs. 2×1	Re. 1×8
Rs. 2×2	Re. 1×6
Rs. 2×3	Re. 1×4
Rs. 2×4	Re. 1×2

When Chitty pays Rs. 5 note/s:

Chitty = Rs. 5×1 , then Witty cannot pay even number of notes.

\therefore Total number of ways = 6 ways.

Correct Answer:

Time taken by you: **14 secs**

Avg Time taken by all students: **26 secs**

Your Attempt: **Skipped**

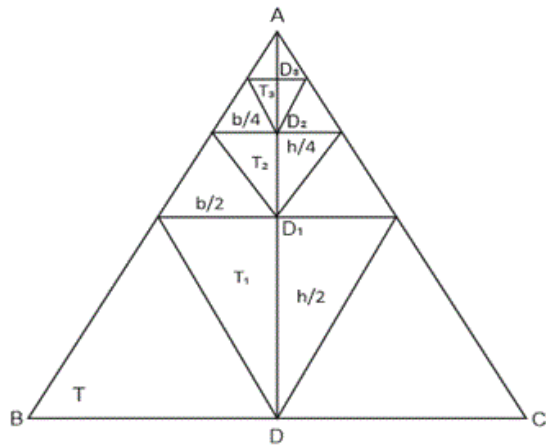
% Students got it correct: **16 %**

Let $T = \triangle ABC$ be an equilateral triangle. Let AD be the median. D_1 is the midpoint of AD . Another equilateral triangle T_1 is drawn with base as a segment parallel to BC passing through D_1 and vertex D . D_2 is the midpoint of AD_1 . Base of triangle T_2 is parallel to BC , passes through D_2 . D_1 is the vertex of T_2 and so on. Find the ratio of area of T to sum of areas of T_1, T_2, \dots

- ☐ 4 : 3
- ☐ 1 : 3
- ☐ 3 : 1
- ☐ 16 : 3

Explanation:

The given figure can be drawn as follows:



Let base of T be b and the height be h .

\therefore Base of T_1 is $\frac{b}{2}$ and height be $\frac{h}{2}$.

Base of T_2 is $\frac{b}{4}$ and height be $\frac{h}{4}$ and so on.

$$\frac{1}{2} \times h \times h$$

Correct Answer:

Time taken by you: **86 secs**

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

Your Attempt: **Skipped**

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



Given that $1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{99} + \frac{1}{100} = \alpha$ and $1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{49} + \frac{1}{50} = \beta$, find $1 + \frac{1}{3} + \frac{1}{5} + \dots + \frac{1}{97} + \frac{1}{99}$.

☐ $\frac{\alpha + \beta}{2}$

☐ $\frac{\alpha + 2\beta}{2}$

☐ $\frac{\alpha - 2\beta}{2}$

☐ $\frac{2\alpha - \beta}{2}$

Explanation:

$$\begin{aligned}
 & 1 + \frac{1}{3} + \frac{1}{5} + \dots + \frac{1}{97} + \frac{1}{99} \\
 &= \left(1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{99} + \frac{1}{100}\right) - \left(\frac{1}{2} + \frac{1}{4} + \frac{1}{6} + \dots + \frac{1}{98} + \frac{1}{100}\right) \\
 &= \left(1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{99} + \frac{1}{100}\right) - \frac{1}{2} \left(1 + \frac{1}{2} + \frac{1}{3} + \dots + \frac{1}{49} + \frac{1}{50}\right) \\
 &= \alpha - \frac{1}{2} \beta \\
 &= \frac{2\alpha - \beta}{2}
 \end{aligned}$$

Hence, [4].

Correct Answer:

Time taken by you: **93 secs**

Avg Time taken by all students: **113 secs**

Your Attempt: **Skipped**

% Students got it correct: **68 %**

Maya has five red, four yellow, six pink and five white roses. All flowers of same color are identical. She wants to make a bouquet using at least three of these flowers. In how many different ways can she select the flowers?

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



Explanation:



Maya has five red roses.

She will not use any red rose in the arrangement or she will use exactly one red rose or she will use only 2 red roses and so on in the arrangement.

Thus, she can use any red rose in the arrangement or she will use exactly one red rose or she will use only 2 red roses and so on in the arrangement.

Thus, she can use red roses in 6 ways.

\therefore She can use all the flowers in $6 \times 5 \times 7 \times 6 = 1260$ different ways.

But in one of these ways she does not use any flower. She uses exactly one flower of a certain colour in 4 ways.

She can use two flowers of different colours in ${}^4C_2 = 6$ ways and two flowers of the same colour in 4 ways.

\therefore She uses exactly two flowers in 10 ways.

\therefore The required number of ways = $1260 - (1 + 4 + 10) = 1245$.

Therefore the required answer is 1245.

Correct Answer:



Time taken by you: **40 secs**

Avg Time taken by all students: **2 secs**

Your Attempt: **Skipped**

% Students got it correct: **2 %**

How many numbers are there between 100 & 1000 (both inclusive) such that the unit's digit is either 3 or 8 but the ten's digit is not 5 or 1?

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:

Unit's digit can be selected in 2 ways.

Ten's digit can be selected in $10 - 2 = 8$ ways.

Hundred's digit can be selected from 1, 2, ..., 9 in 9 ways.

$\therefore 9 \times 8 \times 2 = 144$ numbers satisfy the given condition.

Therefore, the required answer is 144.

Correct Answer:

Time taken by you: **51 secs**

Avg Time taken by all students: **77 secs**

Your Attempt: **Correct**

% Students got it correct: **57 %**

Pipes P, Q and R together fill a cistern in 4 hours. Pipe P alone fills the cistern in half the time as compared to pipe Q alone, while pipe Q alone fills the cistern in half the time as compared to pipe R alone. How much time (in hours) will pipe Q take to fill the tank independently?

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:

Ratio of the time taken by P, Q and R = 1 : 2 : 4

∴ Ratio of the rate at which P, Q and R fill the tank = 4 : 2 : 1

Let the capacity of the tank = $4 \times (4x + 2x + x) = 28x$

∴ Time taken by pipe Q to fill the tank independently = $\frac{28x}{2x} = 14$ hours.

Therefore, the required answer is 14.

Correct Answer:

Time taken by you: 52 secs

Avg Time taken by all students: 108 secs

Your Attempt: Correct

% Students got it correct: 74 %

The number of 3-digit numbers having exactly 18 factors is

- ☒ 8 ❌
- ☐ 10
- ☐ 12
- ☐ More than 12



Oops, you got it wrong!

Explanation:

A number with 18 factors will be of the form a^{17} or ab^8 or a^2b^5 or ab^2c^2 (where a, b and c are prime numbers).

The number of primes satisfying the given condition (the number should be 3-digit, i.e., Less than 1000) for each case are as follows:

Case	a	b	c	Number
a^{17}				Not possible
ab^8	3	2		768
$a^2 \times b^5$	3	2		288
	5	2		800
	2	3		972
ab^2c^2	5	2	3	180
	7	2	3	252
	11	2	3	396
	13	2	3	468
	17	2	3	612
	19	2	3	684
	23	2	3	828
	2	3	5	450
	3	2	5	300
	7	2	5	700

Correct Answer:

Time taken by you: **168 secs**

Avg Time taken by all students: **74 secs**

Your Attempt: **Wrong**

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

A grocer cheats his customers by using a faulty weighing balance. The left pan of his balance weighs 200 gm more than the right pan. While selling, he keeps the goods in the left pan and while buying, he keeps the weight measure in the left pan. In a particular transaction, if he buys and sells 1 kg of wheat using the faulty balance and claims to sell it for neither profit nor loss, find his profit percentage. (Assume he manages to sell his entire stock of wheat in this manner for all transactions and is never left with any stock).

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

 %

Congratulations, you got it correct!

Explanation:

The grocer sells 800 gm when he claims to sell 1000 gm and he buys 1200 gm when he claims to buy 1000 gm.

Let x be the real cost price of 1000 gm of wheat.

Then the grocer's cost price per kg = $\frac{1000x}{1200} = \frac{x}{1.2}$

The grocer sells 800 gm for Rs. x .

\therefore His selling price per kg = $\frac{1000x}{800} = \frac{x}{0.8}$

\therefore His profit percentage = $\frac{\frac{x}{0.8} - \frac{x}{1.2}}{\frac{x}{1.2}} \times 100 = 50\%$

Therefore, the required answer is 50.

Correct Answer:

Time taken by you: **93 secs**

Avg Time taken by all students: **73 secs**

Your Attempt: **Correct**

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

Consider a uniform cylinder of height h cm and radius $\frac{4}{\pi}$ cm. A string of thickness t cm, when wound around the cylinder without keeping any space between two turns, covers the lateral surface of the cylinder completely. What is the length of the string?

☒ $\frac{4h}{t}$ cm ✖

☐ $\frac{8h}{t}$ cm

☐ $\frac{2h}{t}$ cm

☐ $8h$ cm



Oops, you got it wrong!

Explanation:

If we open the cylinder (along a vertical line), its base length = $2\pi r = 2\pi \times \frac{4}{\pi} = 8$ cm.

Since, thickness of the string is t cm.

$$\text{Number of turns} = \frac{\text{height of cylinder}}{\text{thickness of the string}} = \frac{h}{t}$$

$$\therefore \text{Length of the string} = \text{base length} \times \text{number of turns} = \frac{8h}{t} \text{ cm.}$$

Hence, [2].

Correct Answer:

Time taken by you: **73 secs**

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

Your Attempt: **Wrong**

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

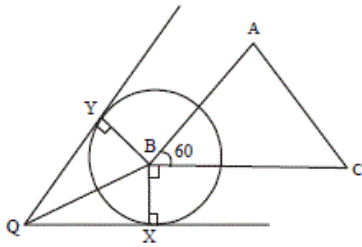
Three circles having equal radii are drawn such that each circle touches the other two circles at exactly one point. A, B and C are the centres of the three circles and $\triangle ABC$ is drawn using these three points. Another triangle $\triangle PQR$ is drawn such that each of its three sides is tangent to two of the three circles. Then side PQ of $\triangle PQR$ is:

- ☐ $\frac{\sqrt{3}}{2}$ times the radius of the three circles
- ☒ $(1 + \sqrt{3})$ times the side of $\triangle ABC$ ✓
- ☐ $2\sqrt{3}$ times the radius of the three circles.
- ☐ $\sqrt{3}$ times the radius of the three circles



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

Explanation:



Since $\triangle BYQ \cong \triangle BXQ$

$$m\angle YQB = m\angle XQB = \frac{1}{2} \times 60 = 30^\circ \text{ (As } \triangle PQR \text{ is an equilateral triangle)}$$

If side of $\triangle ABC = a$, then radius of the three circles = $\frac{a}{2}$

$$\Rightarrow \text{In } \triangle BXQ, BX = \frac{a}{2} \Rightarrow QX = \frac{\sqrt{3}}{2}a$$

$$\therefore \text{Side of } \triangle PQR = \frac{\sqrt{3}}{2}a + a + \frac{\sqrt{3}}{2}a = (1 + \sqrt{3})a$$

Correct Answer:

Time taken by you: 148 secs

Avg Time taken by all students: 184 secs

Your Attempt: Correct

% Students got it correct: 73 %

