A thief stole some cash from an ATM machine and started running at a speed $3\frac{1}{3}$ m/s. The security guard learnt about the theft exactly five minutes after the thief started running. The security guard and his dog started chasing the thief. The security guard ran at a speed double that of the thief while his dog ran at a speed thrice that of the thief. The dog started with the security guard ran up to the thief and immediately returned to the security guard. This process continued till the security guard caught the thief. What was the total distance run by the dog (in m)?

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

2000

😔 Oops, you got it wrong!

   ▾ ⌄

Explanation: ⌄

....

∴ The relative speed of the security guard = 400 − 200 = 200 m/min.

∴ The time taken by the security guard to catch the thief = $\dfrac{1000}{200}$ = 5 minutes

The dog was running for 5 minutes and the speed of the dog = 3 × 200 = 600 m/min.

∴ The distance run by the dog = 5 × 600 = 3000 m.

Therefore, the required answer is 3000.

Alternatively,

The security guard ran at a speed double that of the thief

∴ Relative speed = speed of the thief

∴ The security guard must have taken 5 minutes to catch the thief.

The speed of the dog = $\left(3 \times 3\dfrac{1}{3}\right)$ m/s = 10 m/s

Total distance run by the dog = 5 × 60 × 10 = 3000 m.

Correct Answer: ❯

Time taken by you: **249 secs**

Avg Time taken by all students: **88 secs**

Your Attempt: **Wrong**

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

Previous   Next   Exit Review

ABCDEF and GHIJKL are regular hexagons with G, H, I, J, K and L being the midpoints of sides of the hexagon ABCDEF. □PQRS is a rectangle inscribed in the hexagon GHIJKL such that P, Q, R and S are the midpoints of the sides of GH, HI, JK and KL. Find the area of □PQRS, if ℓ(AB) = 15 cm.
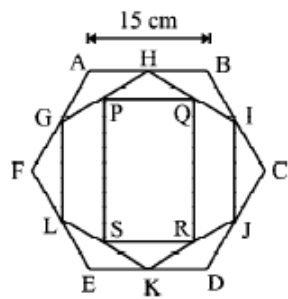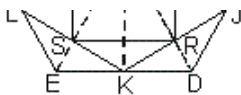

○ $\dfrac{2025\sqrt{3}}{16}$ sq. cm ✔

○ $\dfrac{1225\sqrt{3}}{8}$ sq. cm

○ $\dfrac{5625\sqrt{3}}{2}$ sq. cm

○ $\dfrac{3025\sqrt{3}}{4}$ sq. cm

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

Previous   Next   Exit Review

Explanation:

'O' is centre of the hexagons.

$\triangle$EOD, $\triangle$KOJ and $\triangle$OSR are equilateral triangles.

In $\triangle$EOD, ℓ(ED) = 15 cm $\Rightarrow$ ℓ(OK) = $\frac{\sqrt{3}}{2}$ × 15 = $\frac{15\sqrt{3}}{2}$ cm

In $\triangle$KOJ, ℓ(OR) = $\frac{\sqrt{3}}{2}$ × $\left(\frac{15\sqrt{3}}{2}\right)$ = $\frac{45}{4}$ cm

ℓ(OR) = ℓ(OS) = ℓ(SR) = $\frac{45}{4}$ cm

Now, S-O-Q and ℓ(SQ) = 2 × ℓ(OS) = $\frac{45}{2}$ cm

In $\triangle$SRQ, by Pythagoras' theoreum,

ℓ(QR) = $\sqrt{\left(\frac{45}{2}\right)^2 - \left(\frac{45}{4}\right)^2}$

= 45 × $\sqrt{\frac{1}{4} - \frac{1}{16}}$ = 45 × $\sqrt{\frac{3}{16}}$ = $\frac{45\sqrt{3}}{4}$ cm

Correct Answer: ❯

Time taken by you: **203 secs**

Avg Time taken by all students: **212 secs**

Your Attempt: **Correct**

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

The number of people in an auditorium is a perfect square not greater than 400. Which of the following cannot be the ratio of males to females in the auditorium?

○   71 : 73

○   149 : 251

○   101 : 61

◉   137 : 61 ✔

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

Explanation: ⌄

Note that the number of people in the auditorium is a perfect square.

Consider options:

1]   71 + 73 = 144, which is perfect square.

2]   149 + 251 = 400, which is a perfect square.

3]   101 + 61 = 162, 162 × 2 = 324 < 400, 324 is a perfect square.

4]   137 + 61 = 198, 198 × 2 = 396, 198 × 3 > 400

∴ If the ratio of males to females in the auditorium is 137 : 61, the number of people can not be a perfect square.

Hence, [4].

Correct Answer: ➔

Time taken by you: **64 secs**

Avg Time taken by all students: **127 secs**

Your Attempt: **Correct**

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

Previous   Next   Exit Review

In the X-Y plane, the area of the region bounded by the graph of $|x + 1| + ||y| + 1| = 2$ is:

- ⦿   2 sq. units ✔
- ○   4 sq. units
- ○   8 sq. units
- ○   16 sq. units

Congratulations, you got it correct!

In the X-Y plane, the area of the region bounded by the graph of $|x + 1| + ||y| + 1| = 2$ is:

- ⦿   2 sq. units ✔

Previous   Next   Exit Review
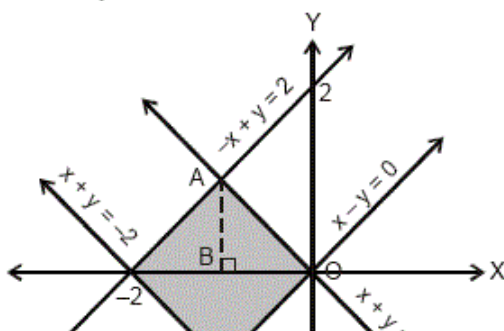
Explanation:

$|x + 1| + ||y| + 1| = 2$
$\Rightarrow |x + 1| + |y| = 1 \; [\because ||y| + 1| = |y| + 1]$
Case (i): $x > -1$, $y > 0$
$x + 1 + y = 1$
$\Rightarrow x + y = 0$
Case (ii): $x > -1$, $y < 0$
$x + 1 - y = 1$
$\Rightarrow x - y = 0$
Case (iii): $x < -1$, $y > 0$
$-x - 1 + y = 1$
$\Rightarrow y - x = 2$
Case (iv): $x < -1$, $y < 0$
$-x - 1 - y = 1$
$\Rightarrow x + y = -2$

Correct Answer:

Time taken by you: **189 secs**

Avg Time taken by all students: **72 secs**

Your Attempt: **Correct**

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

Previous   Next   Exit Review

Chess game between A and B can end in either A winning or B winning or in a draw. The probability of A not losing is $\frac{4}{5}$ and that of B not losing is $\frac{2}{5}$. What is the probability of a draw?

- ◉ $\frac{1}{5}$ ✔

- ○ $\frac{2}{5}$

- ○ $\frac{3}{5}$

- ○ $\frac{4}{5}$

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

Previous   Next   Exit Review

Explanation: ⌄

Probability that A does not lose = Probability that A wins + Probability of draw.

Similarly, for B

$\therefore \dfrac{4}{5} + \dfrac{2}{5} = 1 +$ Probability of draw.

(As, Probability that A wins + Probability that B wins + Probability of draw = 1)

$\therefore$ Probabiltiy of draw $= \dfrac{1}{5}$

Hence, [1].

Correct Answer: ❯

Time taken by you: **70 secs**

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

Your Attempt: **Correct**

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

Previous   Next   Exit Review

If log[(x − 16)(x − 10)(x − 2)] = (x − 17)(16 − x)(x − 14)log(0.5), then what is the value of x?

○ 10

○ 2

○ 20

◉ 18 ✔

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

Previous   **Next**   **Exit Review**

Explanation:

$\log(x-16)(x-10)(x-2)$

$= (x-17)(16-x)(x-14)\log(0.5)$

$= (x-17)(16-x)(x-14)\log\left(\dfrac{1}{2}\right)$

$= (x-17)(16-x)(x-14)\log(2^{-1})$

$= \log 2^{(x-17)(x-16)(x-14)}$

$\therefore \ (x-16)(x-10)(x-2)$

$= 2^{(x-17)(x-16)(x-14)}$

The above expression is true only for option [4] i.e., x = 18.

Hence, [4].

Note :

Option [1] and [2] are easily eliminated as LHS = 0 and 2 to any power will not be zero.

In option [3] LHS = 4 × 10 × 18 which has factors other than 2.

Correct Answer: ❯

Time taken by you: **121 secs**

Avg Time taken by all students: **165 secs**

Your Attempt: **Correct**

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

Previous   Next   Exit Review

All possible pairs of distinct numbers ('a' and 'b', such that a > b) are chosen from the set of first 30 natural numbers. How many of these pairs are such that $(a^2 - b^2)$ is divisible by 3?

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

Explanation: ⌄

$a^2 - b^2 = (a + b)(a - b)$

In order to ensure $(a^2 - b^2)$ is divisible by 3, either $(a + b)$ or $(a - b)$ or both should be divisible by 3.

Both 'a' and 'b' can be of the form 3k, 3k + 1 or 3k + 2.

Case 1 : If both 'a' and 'b' are of the form 3k, both $(a + b)$ and $(a - b)$ are divisible by 3.

'a' and 'b' can be any two out of the ten multiples of 3 from 1 to 30 (such that a > b).
The number of ways of selecting the two numbers = $^{10}C_2$.

Case 2: If both 'a' and 'b' are of the form 3k + 1, or 3k + 2 only $(a - b)$ is divisible by 3.

If one is of the form 3k + 1 and the other is of the form 3k + 2, only $(a + b)$ is divisible by 3. Thus, 'a' and 'b' divisible by 3. The two numbers can be selected in $^{20}C_2$ different ways.

$$\therefore \text{ Required answer} = {}^{10}C_2 + {}^{20}C_2 = \frac{10!}{8!2!} + \frac{20!}{18!2!}$$

= 45 + 190 = 235.

Therefore, the required answer is 235.

Correct Answer: ❯

Time taken by you: **65 secs**

Avg Time taken by all students: **10 secs**

Your Attempt: **Skipped**

% Students got it correct: **4 %**

Previous   Next   Exit Review

Total manufacturing cost has two components: the first is the fixed cost, which is independent of the number of units manufactured and the second is the variable cost, which is directly proportional to the number of units manufactured. After strict cost-cutting measures were implemented, the fixed cost could be reduced by 20% and the variable cost could be reduced by 10% per unit manufactured, as a result of which the total cost of manufacturing 100 units was reduced by 12%. What would have been the contribution of the fixed cost in the total manufacturing cost of 225 units before cost cutting measures were implemented?

○   10%

○   20%

○   25%

○ $33\frac{1}{3}$%

Explanation:

Suppose F is the fixed cost and v is the cost of manufacturing one unit before cost cutting measures were implemented.

∴ Total original manufacturing cost = F + 100v

After cost-cutting measures were implemented, new Fixed Cost = 0.8F and new variable cost = 0.9v per unit.

∴ Total new manufacturing cost = 0.8F + 100(0.9v) = 0.8F + 90v

New cost is less than the original cost by 12% or new cost is 88% of the old cost.

$$\therefore \frac{0.8F + 90v}{F + 100v} = \frac{88}{100}$$

∴ 80F + 9000v = 88F + 8800v
∴ 8F = 200v
∴ F = 25v

Therefore, the total cost of manufacturing 225 units before cost-cutting measures were implemented = F + 225v = 25v + 225v = 250v

$$\therefore \text{Contribution of the fixed cost to the total cost} = \frac{25v}{250v} \times 100 = 10\%$$

Hence, [1].

Correct Answer:

Time taken by you: **2 secs**

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

Your Attempt: **Skipped**

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

Previous   Next   Exit Review

A group of players play a game in which for each round each player pays entry fee equal to the amount equal to the number of players in the group. The number of rounds of the game they play is equal to the number of players in their group. In each round, there is only one winner and the winner gets prize money equal to the entry fee paid by all the players in the round. If a person who wins half the number of rounds earns a profit equal to four times the money he contributes for each round, then the number of players in the group is: (Note: profit earned by a player = amount of prize money earned - amount of entry fee paid)

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

Explanation:

Each person contributes $N \times N = N^2$ in N games.

Since a person wins half of the games

i.e., $\dfrac{N}{2}$ games, he gets $\dfrac{N}{2} \times N^2 = \dfrac{N^3}{2}$.

∴ He earns $\dfrac{N^3}{2} - N^2 = 4N$

∴ $N^3 - 2N^2 - 8N = 0$

⇒ $N^2 - 2N - 8 = 0$ ⇒ $N = 4$.

Therefore, the required answer is 4.

Correct Answer: ❯

Time taken by you: **1 secs**

Avg Time taken by all students: **67 secs**

Your Attempt: **Skipped**

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

Previous   Next   Exit Review

If two acid solutions A and B are mixed in the ratio 3 : 4, the resultant solution has concentration $\frac{300}{7}$ %. On the other hand, if solutions B and A are mixed in the ratio 3 : 4, the resultant solution has concentration $\frac{330}{7}$ %. What is the concentration of solution A (in %)?

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

60

Congratulations, you got it correct!

Previous   Next   Exit Review

Change Section here ▾ ⌄

01:45

Explanation: ⌄

Suppose the concentrations of solutions A and B are a% and b% respectively.

$$\therefore \frac{3a + 4b}{7} = \frac{300}{7} \text{ or } 3a + 4b = 300$$

$$\therefore \frac{4a + 3b}{7} = \frac{330}{7} \text{ or } 4a + 3b = 330$$

Solving the two equations simultaneously, we get a = 60 and b = 30

Therefore, the required answer is 60.

Correct Answer: ❯

Time taken by you: **158 secs**

Avg Time taken by all students: **105 secs**

Your Attempt: **Correct**

% Students got it correct: **46 %**

Previous   Next   Exit Review

A three-digit number, when multiplied by 2, gives a four-digit number with at least one digit as 2. How many such three-digit numbers are possible?

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

02:53

Explanation: ⌄

The smallest and the largest four-digit numbers obtained by multiplying a three-digit number by 2 is $500 \times 2 = 1000$ and $999 \times 2 = 1998$.
Also, the four-digit number must be an even number.

The total number of even numbers between 1000 and 1998 (both inclusive) $= \dfrac{1998 - 1000}{2}$

$+ 1 = 500$.
Of these 500 numbers, the number of those that do not have 2 as any of the digits $= 9 \times 9 \times 4 = 324$.
∴ The total number of three-digit numbers satisfying the condition in the question $= 500 - 324 = 176$.

Therefore, the required answer is 176.

Correct Answer: ❯

Time taken by you: **32 secs**

Avg Time taken by all students: **5 secs**

Your Attempt: **Skipped**

% Students got it correct: **3 %**

If x^2, y^2 and z^2 are in AP and $x \neq y \neq z$, then $y + z$, $z + x$, $x + y$ are in _____.

○   AP

○   GP

○   HP

◉   None of these ❌

😔   Oops, you got it wrong!

If x^2, y^2 and z^2 are in AP and $x \neq y \neq z$, then $y + z$, $z + x$, $x + y$ are in _____.

○   AP

○   GP

Previous   **Next**   **Exit Review**

02:14

Explanation:

$2y^2 = x^2 + z^2$
$2zx + 2y^2 + 2xy + 2yz$
$= x^2 + z^2 + 2xy + 2yz + 2zx$
$2x(z + y) + 2y(y + z) = (x + z)^2 + 2y(x + z)$
$\Rightarrow 2(x + y)(y + z) = (x + z)(x + z + 2y)$
$= (x + z)(x + y + y + z)$

$$\frac{2}{x + z} = \frac{x + y + y + z}{(x + y)(y + z)} = \frac{1}{y + z} + \frac{1}{x + y}$$

$\Rightarrow y + z, z + x, x + y$ are in HP.
Hence, [3].

Alternatively,

If $x^2 = 1$, $y^2 = 2$, $z^2 = 3$, three numbers x^2, y^2 and z^2 will be in AP
$\therefore x = 1, y = \sqrt{2}, z = \sqrt{3}$
$\therefore y + z = \sqrt{2} + \sqrt{3}$
$z + x = 1 + \sqrt{3}$
$x + y = 1 + \sqrt{2}$

Using options:

Option 1: If the three numbers a, b, c are in AP, 2b = a + c

Correct Answer:

Time taken by you: **85 secs**

Avg Time taken by all students: **64 secs**

Your Attempt: **Wrong**

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

Previous   Next   Exit Review

An elastic rope of length 5 m is fixed to the ground at its two ends. The rope was stretched and converted into an arc of a circle, which subtends an angle of 60° at the centre. What is the distance of the midpoint of the stretched rope from the midpoint of the rope in original position? (Assume the stretched rope expands in such a way that the end points of the arc are the same as the end points of the rope in its original position.)
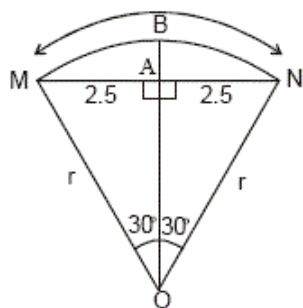
○　　0.866 m ✖

○　　0.67 m

○　　1.18 m

○　　1.732 m

😞 Oops, you got it wrong!

Previous　　　Next　　　　Exit Review

Explanation:

Let M, N be the two end points of the rope.

A and B are midpoints of chord MN and arc MN respectively.
m∠MON = 60° ⇒ ΔMON is an equilateral triangle.

$$OB \perp MN \Rightarrow OA = \frac{\sqrt{3}}{2} \times 5 = \frac{5\sqrt{3}}{2}$$

Also, OB = 5 m

$$\therefore AB = OB - OA = 5 - \frac{5\sqrt{3}}{2} \approx 5 - \frac{8.66}{2} = 0.67 \text{ m}$$

Hence, [2].

Correct Answer:
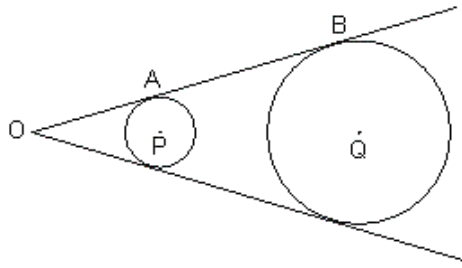
Time taken by you: **289 secs**

Avg Time taken by all students: **172 secs**

Your Attempt: **Wrong**

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

Previous   Next   Exit Review

In the figure, the two circles have P and Q as their centers and AB is their common tangent. AB = 2 × OA and the sum of the circumferences of the two circles is 14π units.
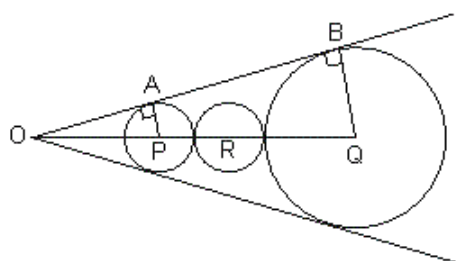
If OQ = 36 units, find the circumference of the circle, with centre R, touching the two circles externally such that O-P-R-Q.

- ○ 24π units

- ○ 12π units

- ○ 17π units

- ○ 25π units

02:48

Explanation: ⌄

$m\angle OAP = m\angle OBQ = 90°$

By AA test, $\triangle OAP \sim \triangle OBQ$

$\Rightarrow \dfrac{OP}{OQ} = \dfrac{OA}{OB} = \dfrac{1}{3}$

$\Rightarrow OP = \dfrac{1}{3} \times OQ = 12$ units.

$\Rightarrow PQ = 24$ units

Let the radius of the two circles be r_1 and r_2 units; then $2\pi r_1 + 2\pi r_2 = 14\pi$

$\Rightarrow r_1 + r_2 = 7$ units.

Correct Answer: >

Time taken by you: **31 secs**

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

Your Attempt: **Skipped**

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

Previous   Next   Exit Review

Consider a sequence of 7 consecutive even integers. The average of the first five consecutive even integers is 'x'. Find the average of all seven integers.

- ⦿   x + 2 ✔
- ○   x + 1
- ○ $x + \dfrac{2}{7}$
- ○ $x + \dfrac{5}{7}$

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

Explanation: ✔

The seven consecutive even integers: $(x-4), (x-2), x, (x+2), (x+4), (x+6), (x+8)$

∴ Sum of all seven integer $= 7x + 14$

∴ Average $= \dfrac{7x+14}{7} = x + 2$

Hence, [1].

Correct Answer: ❯

Time taken by you: **52 secs**

Avg Time taken by all students: **131 secs**

Your Attempt: **Correct**

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

'x' workers with the same efficiency start a piece of work and every day two more workers with equal efficiencies as the earlier ones are added to the work force. The work is completed in 64 days. '2x' workers were working on the last day. '2x' workers working together can finish the work in:

○   32 days ✖

○   16 days

○   48 days

○   24 days

😣 Oops, you got it wrong!

Explanation:

We get an AP with $a = x$, $d = 2$, $n = 64$ and $T_{64} = 2x$

$\therefore T_{64} = a + (n-1)d = x + 63 \times 2 = 2x$

$\Rightarrow x = 126$

$\therefore$ Total man-days required to complete the work $= S_{64} = \dfrac{64}{2}(2 \times 126 + 63 \times 2) = 32 \times 378$

$\therefore$ 2x = 252 workers working together can finish the work in $\dfrac{32 \times 378}{252} = 48$ days.

Hence, [3].

Alternatively,

Day	No. of workers	Day	No. of workers
1	x	64	2x
2	x + 2	63	2x − 2
3	x + 4	62	2x − 4
.		.	
.		.	
.		.	

Correct Answer:

Time taken by you: **234 secs**

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

Your Attempt: **Wrong**

% Students got it correct: **46 %**

Previous   Next   Exit Review

Three test tubes having equal heights, but unequal radii, are kept in a test tube stand. The radii of these test tubes are in arithmetic progression, with the first term and the common difference each equal to 1 cm. If 200 cubic centimeter of acid is filled in each tube, find the ratio of the heights of acid other than that in the hemisphere in these tubes. [Consider the bottom of test tube to be a hemisphere]

○ $(150 - 4\pi) : \left(\frac{75}{2} - 8\pi\right) : \left(\frac{50}{3} - 12\pi\right)$

○ $(300 - 2\pi) : (150 - 2\pi) : \left(\frac{100}{3} - 4\pi\right)$

○ $(600 - 2\pi) : (150 - 4\pi) : \left(\frac{200}{3} - 6\pi\right)$

○   None of these

Explanation:

Radii of the three test tubes are 1 cm, 2 cm and 3 cm. Volume of hemisphere with radius 1 cm

$$= \frac{2}{3}\pi (1)^3 = \frac{2\pi}{3} \text{ cm}^3$$

Volume of acid in the remaining tube $= \left(200 - \frac{2\pi}{3}\right) \text{ cm}^3$

As the remining portion of the tube is in the shape of a cylinder, with height of the acid above the hemisphere being h_1. Say...

$$\therefore \pi(1)^2 h_1 = 200 - \frac{2\pi}{3}$$

$$h_1 = \left(\frac{600 - 2\pi}{3\pi}\right) \text{ cm} \qquad \qquad ... (i)$$

Volume of hemisphere with radius 2 cm $= \frac{2}{3}\pi(2)^3 = \frac{16\pi}{3} \text{ cm}^3$

Volume of acid in the remaining tube $= \left(200 - \frac{16\pi}{3}\right) \text{ cm}^3$

Let the level of acid be h_2 above the hemisphere

16π

Correct Answer:

Time taken by you: **29 secs**

Avg Time taken by all students: **161 secs**

Your Attempt: **Skipped**

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

Previous   Next   Exit Review

Consider ΔPQR. A circle is drawn with QR as its diameter. The circle intersects PQ at S and PR at T. RS bisects ∠R and QT bisects ∠Q. Find (QT + RS) if QR = 6 cm
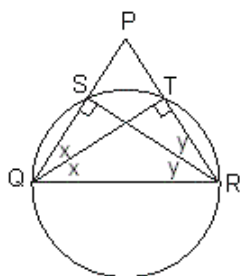
- ○ $3\sqrt{3}$ cm

- ○ $(3 + 3\sqrt{3})$ cm

- ○ 6 cm

- ◉ $6\sqrt{3}$ cm ✔

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

Previous   Next   Exit Review

Explanation:

QR is a diameter of the circle. Therefore, $\angle QSR$ and $\angle RTQ$ are right angles.

By the given conditions,
$2x + y = 90$ and $2y + x = 90$
Solving the two equations, we get $x = y = 30°$
Therefore, $RS = QT = 3\sqrt{3}$ cm
$\therefore QT + RS = 6\sqrt{3}$ cm
Hence, [4].

Correct Answer: >

Time taken by you: **101 secs**

Avg Time taken by all students: **160 secs**

Your Attempt: **Correct**

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

Previous   Next   Exit Review

What is the number of distinct terms in the expansion of $(x + y + z + w)^{12}$?

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

455

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

Previous   Next   Exit Review

Explanation:

Each term in the expansion of $(x + y + z + w)^{12}$ will be of the form $x^a y^b z^c w^d$, where a, b, c and d are whole numbers such that $a + b + c + d = 12$.
Therefore, the required answer is the number of whole number solutions to the equation $a + b + c + d = 12$.

Therefore, the required answer is $\dfrac{15!}{12!3!} = 455$.

Therefore, the required answer is 455.

Correct Answer: ❯

Time taken by you: **11 secs**

Avg Time taken by all students: **40 secs**

Your Attempt: **Correct**

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

Previous   Next   Exit Review

M is a set of odd numbers with an even digit in the hundreds place and an odd digit in tens and units place. All elements of M are divisible by 3. M contains how many elements that lie between 100 and 400?

○   3

○   6

◉   9✔

○   17

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

Previous   **Next**   **Exit Review**

Explanation:

All odd number between 100 and 400 having an even digit in hundreds place, will have digit '2' in hundreds place.

Now as the digit in tens place is odd we have, 21N, 23N, 25N, 27N and 29N where N = Odd digit.

Since numbers are divisible by 3.

For 21N we have, 213 and 219.

For 23N we have, 231 and 237.

For 25N we have, 255.

For 27N we have, 273 and 279.

For 29N we have, 291 and 297.

Hence, [3].

Alternatively,

From 100 to 400, only the numbers between 200 and 299 have even digit in hundreds place.

$\left[\dfrac{299}{3}\right] - \left[\dfrac{200}{3}\right] = 99 - 66 = 33.$

Approximately, half of these will have odd digit at units place and again half of those will have

33

Correct Answer:

>

Time taken by you: **110 secs**

Avg Time taken by all students: **165 secs**

Your Attempt: **Correct**

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

Previous   Next   Exit Review

Ramprasad deposits Rs. 36,000 in a bank for a certain period with rate of interest 9% per annum. He withdraws Rs. 9,000 every four months from his account. Calculate the amount that Ramprasad will receive as simple interest at the end of 16 months.

○   Rs. 2,700

○   Rs. 3,310

○   Rs. 3,240

○   None of these

Explanation:

Ramprasad will withdraw Rs. 9,000 every four months.

Rate of interest is 9% p.a. i.e., $\frac{4}{12} \times 9 = 3\%$ per 4 months.

∴ We have the following:

	Principal	Tenure	Interest	Withdrawal
Month 0-4	36000	4 months	1080	9000
Month 5-8	27000	4 months	810	9000
Month 9-12	18000	4 months	540	9000
Month 13-16	9000	4 months	270	9000

∴ Interest earned = Rs. 2,700

Hence, [1].

Alternatively,

As 36,000 is reduced by 9,000 every four months.

Interest will also decrease by $\frac{9000 \times 3}{100} = $ Rs. 270.

Correct Answer:

Time taken by you: **78 secs**

Avg Time taken by all students: **124 secs**

Your Attempt: **Skipped**

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

Previous   Next   Exit Review

Santa and Banta who are at station X and Y respectively can walk at speeds of 10 kmph and 8 kmph respectively. If they start walking towards each other then after how much time will the distance between them be 9 km for the first time given that the initial distance between them is 135 km?

- ○   6 hours
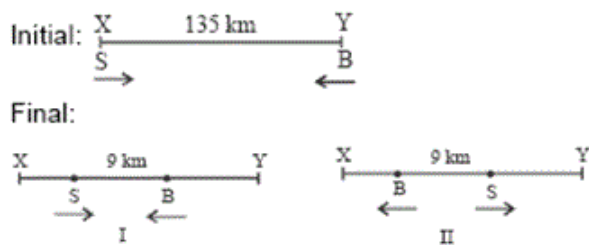
- ○   8 hours

- ◉   7 hours✔

- ○   Cannot be determined

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

Previous   Next   Exit Review

Explanation:

As Santa and Banta are moving towards each other, relative speed = 10 + 8 = 18 kmph.
We have the following cases:

Case I: Relative distance covered = 135 − 9 = 126 km

Time taken is $\dfrac{126}{18}$ = 7 hours.

Hence, [3].

Correct Answer: ❯

Time taken by you: **57 secs**

Avg Time taken by all students: **107 secs**

Your Attempt: **Correct**

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

If roots of the equation $x^3 - 9x^2 + 26x + b = 0$ are integers, then which of the following can be the value of 'b'?

○   −24 ✔

○   24

○   30

○   −30

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

If roots of the equation $x^3 - 9x^2 + 26x + b = 0$ are integers, then which of the following can be the value of 'b'?

○   −24 ✔

Previous   Next   Exit Review

Explanation: ⌄

$x^3 - 9x^2 + 26x + b = 0$
Let a_1, a_2 and a_3 are the roots.
So we have
$a_1 + a_2 + a_3 = 9$ ... (i)
and

$a_1 \times a_2 + a_2 \times a_3 + a_1 \times a_3 = 26$
$(a_1 + a_2 + a_3)^2 = a_1^2 + a_2^2 + a_3^2 + 2(a_1 \times a_2 + a_2 \times a_3 + a_1 \times a_3)$
$81 = a_1^2 + a_2^2 + a_3^2 + 52$
$a_1^2 + a_2^2 + a_3^2 = 29$ ... (ii)
As roots are integers, Using equation (ii),
we have the roots as {±2, ±3, ±4} {0, ±2, ±5}.
As the equation $a_1 + a_2 + a_3 = 9$ should also be satisfied, we can conclude that
roots should be {2, 3, 4}.
Hence, $2 \times 3 \times 4 = -b$
Hence, $b = -24$.
Hence, [1].

Correct Answer: ❯

Time taken by you: **88 secs**

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

Your Attempt: **Correct**

% Students got it correct: **75 %**

Previous   Next   Exit Review

What is the highest value of 'x' for which $x^3 - 14x^2 + 49x - 36 < 0$?

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

8

Congratulations, you got it correct!

Explanation: ⌄

Consider $x^3 - 14x^2 + 49x - 36$. The sum of the coefficients = $1 - 14 + 49 - 36 = 0$.
Therefore $(x - 1)$ is the factor of $x^3 - 14x^2 + 49x - 36$.
We have, $x^3 - 14x^2 + 49x - 36 = (x - 1)(x^2 - 13x + 36) = (x - 1)(x - 4)(x - 9)$.
$(x - 1)(x - 4)(x - 9) < 0 \Rightarrow x < 1$ or $4 < x < 9$
Therefore, the required answer is 8.

Correct Answer: ❯

Time taken by you: **120 secs**

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

Your Attempt: **Correct**

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

Previous   Next   Exit Review

A cyclic quadrilateral is such that its two adjacent sides are equal to its shorter diagonal. Find the perimeter of the quadrilateral if length of its longer diagonal is 'm' units and it passes through the centre of the circumscribing circle.

○ $m + \dfrac{\sqrt{3}}{2}$ ✖

○ $m(\sqrt{3} + 1)$

○ $2m(1 + \sqrt{3})$

○ $\dfrac{m}{\sqrt{3}} + 1$

😞 Oops, you got it wrong!

Previous   **Next**   **Exit Review**

Explanation:

In ▱ ABCD, without loss of generality assume that BD is the shorter diagonal and BC = CD.

∴ ΔBCD is an equilateral triangle.

As the longer diagonal i.e., AC passes through the centre of the circle, it must be the diameter.

∴ ∠B and ∠D are right angles.
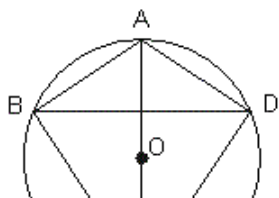
Also, AC bisects ∠C ⇒ m∠ACB = m∠ACD = 30°

⇒ ΔABC ≅ ΔADC by ASA test

⇒ AB = AD

⇒ ▱ABCD is a kite.

Correct Answer:

Time taken by you: **221 secs**

Avg Time taken by all students: **107 secs**

Your Attempt: **Wrong**

% Students got it correct: **59 %**

Previous   Next   Exit Review

If log 4 = 0.6, find log 5.

○   0.64

○   0.66

○   0.69

◉   0.70 ✔

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

If log 4 = 0.6, find log 5.

○   0.64

○   0.66

○   0.69

Previous   Next   Exit Review

Explanation: ∨

$\log 4 = 0.6 \Rightarrow 2 (\log 2) = 0.6 \Rightarrow \log 2 = 0.3$

$\log 5 = \log \left(\dfrac{10}{2}\right) = \log 10 - \log 2 = 1 - 0.3 = 0.7$

Hence, [4].

Correct Answer: >

Time taken by you: **22 secs**

Avg Time taken by all students: **63 secs**

Your Attempt: **Correct**

% Students got it correct: **59 %**

Previous   Next   Exit Review

How many numbers in the set $\left\{\dfrac{99!}{96!}, \dfrac{96!}{93!}, \dfrac{93!}{90!}, \dots, \dfrac{6!}{3!}, \dfrac{3!}{0!}\right\}$ are divisible by 24?

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

6

😔 Oops, you got it wrong!

Previous   Next   Exit Review

05:46

Explanation: ⌄

The set consists of numbers 99 × 98 × 97, 96 × 95 × 94...6 × 5 × 4, 3 × 2 × 1.
Note that each of these numbers is divisible by 3. Also, every alternate terms has
got two even factors, one of which is also divisible by 4. So these alternate numbers
will be divisible by 2 × 4 × 3 = 24. There are 16 such terms.
The remaining (alternate) numbers have got only one even factor. So they will be divisible
by 24 if and only if this factor is also divisible by 8. So we have to look for numbers
where the middle factor is divisible by 8.
But the numbers are of the form 3k (3k − 1) (3k − 2) so we want to find factors
of 8 which are of the form 3k − 1. They will occur after every 24 numbers − 8, 32,
56, 80.
I.e. the numbers 9 × 8 × 7, 33 × 32 × 31, 57 × 56 × 55 and 81 × 80 × 79 will
also be divisible by 8.
So, in all, 16 + 4 = 20 numbers are divisible by 24.

Therefore, the required answer is 20.

Correct Answer: ❯

Time taken by you: **131 secs**

Avg Time taken by all students: **5 secs**

Your Attempt: **Wrong**

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

Previous   Next   Exit Review

What values of y satisfy the following equation?

$$y^{\frac{2}{3}} - y^{\frac{1}{3}} - 6 \le 0$$

○   −27 ≤ y ≤ 8

○   y ≤ −8, y ≥ 27

○   y ≤ −27, y ≥ 8

◉   −8 ≤ y ≤ 27 ✔

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

Explanation: ▾

$$y^{\frac{2}{3}} - y^{\frac{1}{3}} - 6 \le 0$$

Let $y = x^3$

$$\therefore \left(x^3\right)^{\frac{2}{3}} - \left(x^3\right)^{\frac{1}{3}} - 6 \le 0$$

$\therefore x^2 - x - 6 \le 0$

$\therefore (x - 3)(x + 2) \le 0$

$\therefore -2 \le x \le 3$

$\therefore -8 \le x^3 \le 27$

$\therefore -8 \le y \le 27$.

Hence, [4].

Correct Answer: ❯

Time taken by you: **51 secs**

Avg Time taken by all students: **124 secs**

Your Attempt: **Correct**

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

Previous   Next   Exit Review

How many natural numbers from 1 to 2000 have none of their digits repeated?

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

1242

Congratulations, you got it correct!

Previous   Next   Exit Review

Explanation: ⌄

The numbers from 1 to 2000 included single digit, two-digit, three-digit and four-digits numbers.

For two-digit numbers, the digit in the tens place can be any digit except '0' and the digit in the units place can be any digit from 0-9. But as no digit is repeated only 9 digits are possible. So, possible two-digit numbers without repetitions are $^9C_1 \times {}^9C_1 = 81$.

Similarly, for three-digit number, possible numbers without repetition are $^9C_1 \times {}^9C_1 \times {}^8C_1 = 648$ and the four-digit number, possible numbers without repetition are $1 \times {}^9C_1 \times {}^8C_1 \times {}^7C_1 = 504$

∴ Total numbers = 9 + 81 + 648 + 504 = 1242.

Therefore, the required answer is 1242.

Correct Answer: ❯

Time taken by you: **104 secs**

Avg Time taken by all students: **35 secs**

Your Attempt: **Correct**

% Students got it correct: **21 %**

Previous   Next   Exit Review

Total six pipes (either inlets or outlets) can be attached to a tank. All inlet pipes are identical and all outlet pipes are also identical. If four of the six pipes attached are inlet pipes and the other two are outlet pipes, the tank which is initially empty is completely filled in 21 hours. On the other hand, if five of the six pipes are used as inlet pipes and the remaining one pipe as outlet pipe, the tank which is initially empty is completely filled in 6 hours. If three pipes are used as inlet pipes and the remaining three as outlet pipes, in how many hours will the tank which is initially completely full be emptied?

- ○   6 hours

- ○   7 hours

- ○   14 hours

- ○   21 hours

Explanation:

⌄

LCM of 21 and 6 is 42. Suppose the volume of the tank is 42 litres.
Suppose the volume of water filled by each inlet pipe in one hour = 'a' units and the volume of water emptied by each outlet pipe in one hour = 'b' units.

If 4 pipes are used as inlet pipes and 2 pipes are used as outlet pipes, total volume of water filled in one hour = 4a − 2b.
As the tank is filled in 21 hours, volume of water filled in one hour = $\frac{42}{21}$ = 2 litres.

If 5 pipes are used as inlet pipes and 1 pipe is used as outlet pipes, total volume of water filled in one hour = 5a − b.
As the tank is filled in 6 hours, volume of water filled in one hour = $\frac{42}{6}$ = 7 litres.

Therefore, 4a − 2b = 2 and 5a − b = 7. Solving for a and b, a = 2 and b = 3.

If 3 pipes each are used as inlet and outlet pipes, the volume of water emptied per hour = 3(3 − 2) = 3 litres.

Therefore, the time taken to completely empty the tank = $\frac{42}{3}$ = 14 hours.

Hence, [3].

Correct Answer:

❯

Time taken by you: **2 secs**

Avg Time taken by all students: **195 secs**

Your Attempt: **Skipped**

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

Previous   Next   Exit Review

A 750 gm bottle of face mask contains 200 gm of aloe vera gel and 200 gm of honey, mixed with rose water. Manisha takes out 10% of it and substitute it by aloe vera gel of the same amount. From this mixture, if Jigna takes out 20% and substitute the same amount with rose water, the percentage of rose water in the face mask is now:

○   53.6✔

○   30.4

○   20.6

○   46.7

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

Explanation: ⌄

The face mask has 750 – 200 – 200 = 350 gm of rose water.

10% of the quantity removed was replaced by aloevera gel. Hence, rose water after the first replacement = 350 – 35 = 315

When 20% of the face mask is removed, rose water in the remaining = 315 – (20% of 315) = 252 gm.

Now as the removed quantity was replaced by rose water, 20% of 750 = 150 gm of rose water was added to it.

Rose water in the resultant face mask = 252 + 150 = 402

The required percentage = $\frac{402}{750} \times 100 = 53.6$

Hence, [1].

Correct Answer: ❯

Time taken by you: **201 secs**

Avg Time taken by all students: **218 secs**

Your Attempt: **Correct**

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

Previous   Next   Exit Review

If (2, 3) and (−6, −1) are end points of a diagonal of a rectangle. Find its area if the sides are parallel to axes.
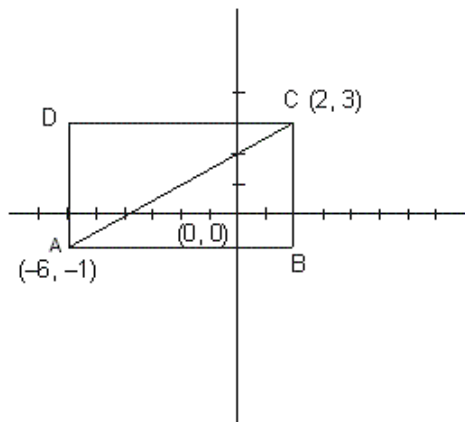
Enter your response (as an integer) using the virtual keyboard in the box provided.

40   Sq. units

😞 Oops, you got it wrong!

Explanation:

AC = 8 units and BC = 4 units

∴ Area of the rectangle = 8 × 4 = 32 sq. units

Therefore, the required answer is 32.

Correct Answer:

Time taken by you: **72 secs**

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

Your Attempt: **Wrong**

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

Previous   Next   Exit Review

Narayan left Mumbai for Pune at 10:00 AM and at the same time Venkatesh left Pune for Mumbai. Both of them took the same route. They met at 11:20 AM If both of them start from Mumbai to Pune at the same time Venkatesh will reach 2 hours earlier than Narayan taking the same route. What is the time taken (in hours) by Narayan to reach Pune?

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

Explanation:

Let the speed of Venkatesh and Narayan be S_1 and S_2 respectively and let 't' hours be the time taken by Venkatesh to go from Pune to Mumbai and 'D' be the distance between Mumbai and Pune.

$$\therefore S_1 \times t = D \qquad \dots (i)$$

$$S_2(t+2) = D \qquad \dots (ii)$$

$$\text{And } (S_1 + S_2)\frac{4}{3} = D \qquad \dots (iii)$$

From (i) and (iii), we get

$$(S_1 + S_2)\frac{4}{3} = S_1 \times t \Rightarrow S_1(3t-4) = 4S_2 \qquad \dots (iv)$$

From (ii) and (iii), we get

$$(S_1 + S_2)\frac{4}{3} = S_2(t+2) \Rightarrow 4S_1 = S_2(2+3t) \qquad \dots (v)$$

From (iv) and (v), we get

$$\frac{4}{3t-4} = \frac{2+3t}{4}$$

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **107 secs**

Your Attempt: **Skipped**

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

Previous   Next   Exit Review

Three inlet pipes named A, B and C have been attached to a tank, which is initially empty. If pipes A and B are used, the tank is completely full in 4 hours. If pipes A and C are used, the tank is completely full in 3 hours. If pipes B and C are used, the tank is completely full in 2 hours and 24 minutes. In how much time will the tank be completely full if all the three pipes are used?

○   1 hour and 48 minutes

◉   2 hours ✔

○   1 hour and 36 minutes

○   1 hour and 24 minutes

☺ Congratulations, you got it correct!

Previous   Next   Exit Review

Explanation:

Given: Pipes A and B together fill the tank in 4 hours. Pipes A and C together fill the tank in 3 hours. Pipes B and C fill the tank in 2.4 hours.

Suppose the volume of the tank = 12 litres (LCM of 4, 3 and 2.4).

Therefore, A and B together fill in $\dfrac{12}{4}$ = 3 litres/hour, A and C together fill in $\dfrac{12}{3}$ = 4 litres/hour and B and C together fill in $\dfrac{12}{2.4}$ = 5 litres/hour.

Therefore, we have A + B = 3; A + C = 4 and B + C = 5.
Solving the three equations simultaneously, we get A = 1, B = 2 and C = 3.

Therefore, if all the three pipes are used, the volume of water filled in one hour = 1 + 2 + 3 = 6 litres.

Therefore, the time taken to completely fill the tank = $\dfrac{12}{6}$ = 2 hours.

Hence, [2].

Correct Answer: ❯

Time taken by you: **325 secs**

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

Your Attempt: **Correct**

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

Previous   Next   Exit Review