If $|x - 3| < 2$ and $|x| > 2$, for how many integers will $|x - 1| < 3$?

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

Video Explanation:

Explanation:

$|x-3| < 2 \Rightarrow -2 < (x-3) < 2 \Rightarrow 1 < x < 5$

$|x| > 2 \Rightarrow x > 2$ and $x < -2$

Therefore, $2 < x < 5$

Only $x = 3$ satisfies all the inequalities.

Therefore, the required answer is 1.

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

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

Raju is a movie freak. Last Sunday, he watched five movie shows one after the other in his favourite multiplex. This multiplex has six screens, each screen showing a different movie. On each screen, a movie is repeated five times a day. If Raju watched exactly one movie twice and three other movies only once, then in how many ways could he have watched the movies?

- $6 \times \frac{5!}{2!}$
- $60 \times \frac{6!}{2!}$
- $6 \times \frac{6!}{2!}$
- $60 \times \frac{5!}{2!}$

Video Explanation:

Explanation:

The movie Raju watched twice can be selected in ${}^6C_1 = 6$ ways.

Out of the five shows of the movie, Raju can select any two in ${}^5C_2 = 5 \times 2$ ways.

The remaining three movies he can see in ${}^5C_3 \times 3! = 5 \times 4 \times 3$ ways.

Thus, Raju could have watched movies in $6 \times 5 \times 2 \times {}^5C_3 \times 3!$ Ways $= 60 \times \frac{5!}{2!}$

Hence, [4].

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **52 secs**

Your Attempt: **Skipped**

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

In a certain office, 35 people read ‘Lokseva’, 32 people read ‘Lokbharti’ and 20 people read ‘Lokman’. Among them, 10 people read only ‘Lokseva’, not more than 12 people read only ‘Lokbharti’ and only 5 people read all the 3 newspapers.

Which of the following statements can be true?

I. The number of people who read only ‘Lokman’ is 10 and the number of people who read exactly two newspapers namely ‘Lokbharti’ and ‘Lokman’ is 5.

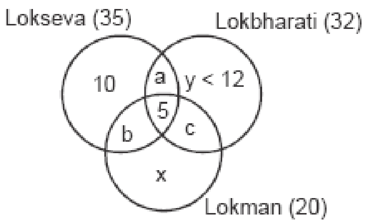
II. The number of people who read exactly two newspapers, namely ‘Lokseva’ and ‘Lokbharti’ is 9 and the number of people who read exactly two newspapers, namely ‘Lokbharti’ and ‘Lokman’ is 8.

III. The number of people who read only ‘Lokbharti’ is 10 and the number of people who read exactly two newspapers, namely ‘Lokseva’ and ‘Lokman’ is 7.

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

Explanation:

From the given data, we get the following Venn diagram.



Consider statement I: x = 10 and c = 5
⇒ b = 20 – x – c – 5 = 20 – 10 – 5 – 5 = 0
⇒ a = 35 – 10 – b – 5 = 35 – 10 – 0 – 5 = 20
⇒ y = 32 – a – 5 – c = 32 – 20 – 5 – 5 = 2, possible.
Consider statement II: a = 9 and c = 8
⇒ b = 35 – 10 – 5 – a = 11
⇒ x = 20 – 5 – b – c = 20 – 24 = –4, not possible.
Consider statement III: y = 10 and b = 7
⇒ a = 35 – 22 = 13 and c = 32 – 28 = 4
⇒ x = 20 – 16 = 4, possible. Hence, [4].

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

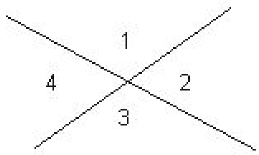
% Students got it correct: **53 %**

If 8 lines are drawn in the plane such that no two of them are parallel and no three or more of them intersect at the same point, what is the maximum number of parts can the plane be divided into?

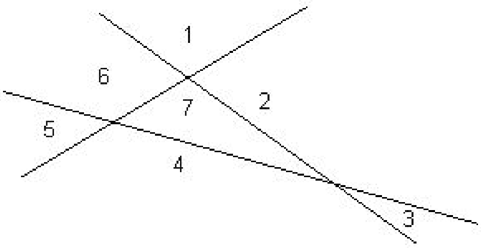
Enter your response (as an integer) using the virtual keyboard in the box provided.

Explanation:

When only one line is drawn, it divides the plane into two parts. When two lines are drawn, they divide the plane into four parts, as shown:



When three lines are drawn, they divide the plane into 7 parts, as shown:



When four lines are drawn, they divide the plane into 11 parts, as shown:

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **25 secs**

Your Attempt: **Skipped**

% Students got it correct: **22 %**

Three cyclists A, B and C competed for a linear race along a track of 1100 m. A started 2 seconds after B but cycled at 1 m/s faster than B. B started 2 seconds after C but cycled 1 m/s faster than C. If A won the race, which of the following could have been the speed of C?

- 25 m/s
- 30 m/s
- 20 m/s
- 35 m/s

Explanation:

If the speed of C is x m/s, the speed of A is $(x + 2)$ m/s and the speed of B is $(x + 1)$ m/s.

$\therefore$ The time taken by A, B and C to run the total distance $= \frac{1100}{x+2}, \frac{1100}{x+1}$ and $\frac{1100}{x}$ seconds respectively.

Given : A started 4 seconds after C and B started 2 seconds after C.

Since A won the race, A beat C.

$$\therefore \frac{1100}{x+2} + 4 < \frac{1100}{x}$$

$$\therefore 4 < \frac{1100 \times 2}{x(x+2)}$$

$$\therefore x(x+2) < 550$$

Since A won the race, A beat B.

$$\therefore \frac{1100}{x+2} + 4 < \frac{1100}{x+1} + 2$$

$$\therefore 2 < 1100\left(\frac{1}{x+1} - \frac{1}{x+2}\right)$$

$$\therefore 2 < 1100 \times \frac{1}{(x+1)(x+2)}$$

Correct Answer:

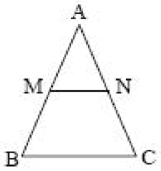
Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

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

Change Section here ▼



In ΔABC, $MN \parallel BC$; $AN : NC = 2 : 3$. If A(Δ ABC) and A(Δ AMN) are both integers, then what could be A(☐BMNC)?

- 21 sq. units
- 42 sq. units
- 63 sq. units
- Any one of the above

Explanation:

Since MN || BC and AN : NC = 2 : 3.

$$\frac{A(\Delta AMN)}{A(\Delta ABC)} = \left(\frac{2}{3+2}\right)^2 = \frac{4}{25}$$

$$\therefore \frac{A(\Delta AMN) + A(\square BMNC)}{A(\Delta AMN)} = \frac{25}{4}$$

$\therefore A(\square BMNC) : A(\Delta AMN) = 21 : 4$

As $A(\square BMNC)$ and $A(\Delta AMN)$ are integers, $A(\square BMNC)$ could be any multiple of 21.

Hence, [4].

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **121 secs**

Your Attempt: **Skipped**

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

Consider set S = {3, 4, 5, 6, ..., 6n + 1} where 'n' is an even positive integer. Define 'X' as the average of integers which are divisible by 3. Define 'Y' as the average of integers which are divisible by 4. What is the value of (Y – X)?

- $\frac{n}{2}$
- $\frac{1}{2}$
- $\frac{n+1}{2}$
- $\frac{-1}{2}$

Explanation:

Since 'n' is a positive even number, let n = 2m

S = {3, 4, ..., 12m + 1}

Now, numbers which are divisible by 3 are {3, 6, 9, ..., 12m}

$\therefore$ X = Average of these terms = $\frac{3 + 12m}{2}$

Now, numbers which are divisible by 4 are {4, 8, 12, ..., 12m}

So, Y = Average of these terms = $\frac{4 + 12m}{2}$

$\therefore (Y - X) = \frac{1}{2}$

Hence, [2].

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

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

Tywin and Tyrion are writing numbers from 1 to 1000 (in decimal system) in base 7 and base 8 systems respectively. How many of the numbers will have a non-zero units digit in both base 7 and base 8 notations?

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

Video Explanation:

03:06

Explanation:

A number written in base system 7 and ends with a zero must be a multiple of 7.

So we have to subtract the numbers divisible by 7 and/or 8 from 1000.

Numbers divisible by 7 (from 1 to 1000) = 142

Numbers divisible by 8 (from 1 to 1000) = 125

Numbers divisible by both 7 and 8 i.e., by 56 (from 1 to 1000) = 17

So the number of numbers with non-zero units digit = 1000 – 142 – 125 + 17 = 750

Therefore, the required answer is 750.

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **19 secs**

Your Attempt: **Skipped**

% Students got it correct: **11 %**

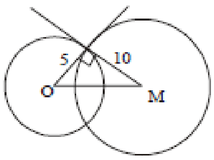
Two circles intersect each other such that the tangents drawn from one of the two points of intersection of the circles to both circles are mutually perpendicular. What is the length of the common tangent if the radii of circles are 10 units and 5 units respectively?

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

units

Explanation:

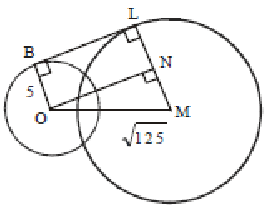
Let O and M be the centres of the two circles.



Since, the tangents are perpendicular at the point of intersection, OM

$= \sqrt{(10^2 + 5^2)} = \sqrt{125}$

Let BL be the required line segment of common tangent and let ON $\perp$ LM.



BL || ON, also since OB || LM, BL = ON.

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **44 secs**

Your Attempt: **Skipped**

% Students got it correct: **23 %**

Two pipes, named A and B are attached to a tank. Everyday, either only A or only B or both pipes are started at the same time to fill an initially empty tank. On Monday, only pipe A was used and the tank was full at 2 pm. On Tuesday, only pipe B was used and the tank was full at 8 pm. On Wednesday, only pipe A was used upto 12 noon and only pipe B was used upto 4 pm, when the tank was completely full. If both pipes were used throughout on Thursday, when will the tank be completely full?

- 12 : 00 noon
- 12 : 24 pm
- 12 : 36 pm
- 11 : 48 am

Explanation:

Suppose pipe A takes ‘t’ hours to fill the tank. Therefore, pipe B would take ‘t + 6’ hours to fill the tank.

On Wednesday, pipe A was used upto 12 noon or it was used for ‘t – 2’ hours and pipe B was used for 4 hours. If pipes A and B fill ‘a’ and ‘b’ units of water every hour, the capacity of the tank = at = at – 2a + 4b

$\therefore 2a = 4b$ or $\frac{a}{b} = 2$.

That means, pipe A fills two times as much water as pipe B in the same time. Therefore, the time taken by pipe A to fill the tank is half the time taken by pipe B to fill the tank.

$\therefore \frac{T_a}{T_b} = \frac{t}{t+6} = \frac{1}{2}$. Therefore, t = 6 hours.

That means, pipe A individually takes 6 hours and pipe B individually takes 12 hours to fill the tank. The same time when the pipes are started = 6 hours before 2 pm i.e. 8 am.

LCM of 6 and 12 = 12. Suppose the capacity of the tank = 12 litres. Therefore, A fills 2 units per hour and B fills 1 unit per hour. If both pipes are used, they together will fill 3 units per hour.

Therefore the time taken by the two pipes together to fill the tank $= \frac{12}{3} = 4$ hours.

Therefore, the time when the tank will be completely full = 8 am + 4 hours = 12 noon.

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

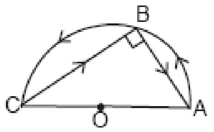
% Students got it correct: **62 %**

Sunidhi starts jogging on a circular track of radius 1 km from the point A at a speed of 6.28 kmph. After reaching a point C, which is diametrically opposite to point A, she realises that she dropped her watch at point B. So she sprints back at a speed of 8 kmph, taking the shortest route to the point B and then she walks back to the point A, again taking the shortest route, the length of which is 1.2 km, at a speed of 3.6 kmph. What is the total time taken by Sunidhi? (π = 3.14).

- less than 1 hour
- more than 1 hour but less than 1 hour 15 minutes.
- more than 1 hour 15 minutes but less than 1 hour 30 minutes.
- Data insufficient

Explanation:

The path Sunidhi took is as follows:



AC is the diameter. Radius, AO = 1 km.

Length of arc ABC = $\frac{2 \times 3.14}{2}$ = 3.14 km

Also, ℓ (AB) = 1.2 km.

$\angle ABC = 90°$

$\Rightarrow AB^2 + BC^2 = AC^2$

$\Rightarrow (1.2)^2 + (BC)^2 = 2^2$

$\Rightarrow BC^2 = 4 - 1.44 = 2.56$

$\Rightarrow$ BC = 1.6 km.

Time taken to run arc ABC = $\frac{3.14}{6.28}$ = 30 minutes.

Time taken to run BC = $\frac{1.6}{8} = \frac{1}{5}$ hr = 12 minutes.

Time taken to run AB = $\frac{1.2}{3.6} = \frac{1}{3}$ hr = 20 minutes.

$\therefore$ Total time taken by Sunidhi

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **144 secs**

Your Attempt: **Skipped**

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

The values of 'x' for which $2x - 11\sqrt{x} + 12 = 0$ is:

- $\frac{1}{4}, 9$
- $\frac{9}{4}, 16$
- $\frac{9}{16}, 4$
- $4, \frac{1}{9}$

Video Explanation:

Explanation:

Put $\sqrt{x} = t \Rightarrow 2t^2 - 11t + 12 = 0$

$\Rightarrow (2t - 3)(t - 4) = 0 \Rightarrow t = \frac{3}{2}, 4$

$\Rightarrow \sqrt{x} = \frac{3}{2}, 4 \Rightarrow x = \frac{9}{4}, 16.$

Hence, [2].

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

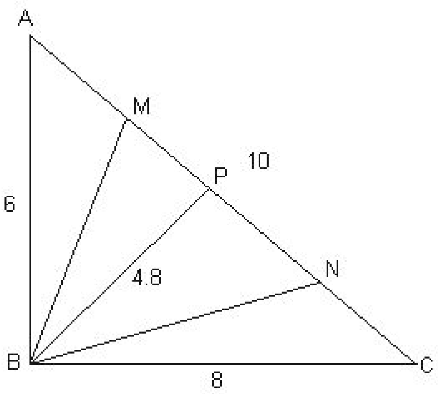
% Students got it correct: **94 %**

ΔABC is a triangle such that ℓ(AB) = 6, ℓ(BC) = 8 and ℓ(AC) = 10. Also, ℓ(BP) = 4.8 cm, where point P lies on side AC such that A-P-C. BM and BN are angle bisectors of angles ABP and CBP respectively such that points M and N lie on side AC of the triangle. What is the area of ΔBMN (in sq. units)?

- 9.6
- 4.8
- 12
- Cannot be determined

Explanation:

Since 6-8-10 is a Pythagorean triplet, ΔABC is a right angled triangle with right angle at B. From the given information, the following diagram can be constructed.



Now, in right angled triangle ABC, ℓ(AB) × ℓ(BC) = ℓ(AC) × ℓ(BP) = 48.
Therefore, BP is perpendicular to hypotenuse AC.

In right angled triangle ABP, using Pythagoras theorem, AP = $\sqrt{6^2 - 4.8^2} = 3.6$

Similarly, in right angled triangle BPC, using Pythagoras theorem, PC = $\sqrt{8^2 - 4.8^2} = 6.4$

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

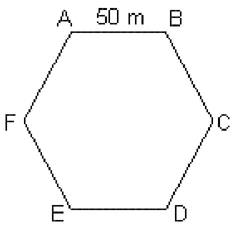
% Students got it correct: **29 %**

A hexagonal playground ABCDEF of each side 50 meters has one lamp post on each vertex. The angle of elevation from point F on the ground to the top of the lamp post at point E is 30 degree and to the top of the lamp post at point D is 45 degrees. What is the difference between the heights of towers at point E and point D.

- 100 meters
- $\frac{100}{\sqrt{3}}$ meters
- $\frac{50}{\sqrt{3}}$ meters
- $25\sqrt{3}$ meters

04:03

Explanation:

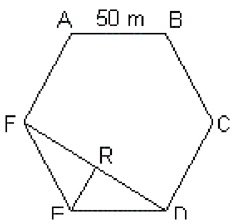


Let the point of the top of lamp post at point E be P. ΔPEF is 30–60–90 triangle.
EF = 50 meters.

Thus, PE = $\frac{50}{\sqrt{3}}$ meters

Let the point of the top of lamp post at point D be Q. ΔQDF is 45–45–90 triangle. So QD = FD

Let us join FD and drop a perpendicular from E to FD, which divides FD in half.



Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

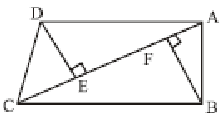
% Students got it correct: **69 %**

Sameer owns a piece of land in the shape of a quadrilateral. Sameer's father takes 10 minutes to walk along a diagonal from one end to the other at the rate of 1.5 m/s; 5 minutes at the rate of 1.25 m/s along one of the perpendiculars to the same diagonal through one of the vertices and 7 minutes along the other perpendicular to the same diagonal from another vertex at 1.75 m/s. Find the area of the land.

- 0.4685 km^2
- 0.4995 km^2
- 0.3065 km^2
- None of these

Explanation:

Let the piece of the land be represented by ◻ABCD.



AC = 1.5 × 10 × 60 = 900 m
DE = 1.25 × 5 × 60 = 375 m
BF = 1.75 × 7 × 60 = 735 m

Area of land = $\frac{1}{2}$ × AC × (DE + BF)

= $\frac{1}{2}$ × 900 × (375 + 735) = 450 × 1110

= 499500 m^2 = 0.4995 km^2.
Hence, [2].

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

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

If $\log_N 2M = 1$ and $\frac{1}{2}\log_M 0.25 + 2\log_5 N = \log_M N + 1$, then find the value of N.

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

Explanation:

$\log_N 2M = 1 \Rightarrow 2M = N^1 \Rightarrow N = 2M$

Now, $\frac{1}{2}\log_M 0.25 + 2\log_5 N = \log_M N + 1$

i.e., $\frac{1}{2} \times \frac{\log 0.25}{\log M} + \frac{2\log N}{\log 5} = \frac{\log N}{\log M} + 1$

i.e., $\frac{1}{2} \times \frac{\log(0.5)^2}{\log M} + \frac{2\log 2M}{\log 5} = \frac{\log 2M}{\log M} + 1$

i.e., $\frac{1}{2} \times 2 \times \frac{\log 1 - \log 2}{\log M} + \frac{\log 4M^2}{\log 5}$

$= \frac{\log 2 + \log M}{\log M} + 1$

$(\because 0.5 = \frac{1}{2}$ and $\log\frac{1}{2} = \log 1 - \log 2)$

i.e., $-\frac{\log 2}{\log M} + \frac{\log 4M^2}{\log 5} = 2 + \frac{\log 2}{\log M}$

i.e., $\frac{\log 4M^2}{\log 5} = 2 + \frac{\log 4}{\log M}$

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

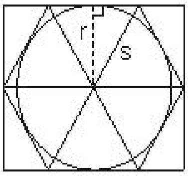
% Students got it correct: **34 %**

A regular hexagon of side 's' circumscribes a circle and is inscribed in a rectangle such that two of the sides of the hexagon lie on the rectangle. If A = the area between the circle and the hexagon and B = the area between the hexagon and the rectangle, what is the value of $\frac{A}{B}$?

- $\frac{3\sqrt{3}-\pi}{\sqrt{3}}$
- $\frac{6\sqrt{3}-\pi}{2\sqrt{3}}$
- $\frac{6\sqrt{3}-3\pi}{2\sqrt{3}}$
- $\frac{6\sqrt{3}-3\pi}{3\sqrt{3}-2}$

Explanation:

Because the hexagon inscribes the circle, the point of intersection of the diagonals of the hexagon is same as the center of the circle. Suppose the hexagon is divided into six congruent equilateral triangles as shown diagram.



If 'r' is the radius of the circle inscribed by the hexagon, the height of each of the six equilateral triangles = r. If 's' is the side of the equilateral triangles, $\frac{\sqrt{3}}{2}s = r$ or $s = \frac{2}{\sqrt{3}}r$

The area of the hexagon = $\frac{3\sqrt{3}}{2}s^2 = \frac{3\sqrt{3}}{2} \times \frac{4}{3}r^2 = 2\sqrt{3}r^2$

The area of the circle = πr^2

$\therefore$ A = The area between the hexagon and the circle = $(2\sqrt{3} - \pi)r^2$

The one side of the rectangle that inscribes the hexagon = 2 × Side of each small equilateral triangle = $2s = \frac{4}{\sqrt{3}}r$

The other side of the rectangle is equal to the diameter of the circle = 2r

$\therefore$ Area of the rectangle = $\frac{4}{\sqrt{3}}r \times 2r$

$\therefore$ B = The area between the rectangle and the hexagon = $\frac{8}{\ }r^2 - 2\sqrt{3}\,r^2$

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **168 secs**

Your Attempt: **Skipped**

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

At a construction site, if 6 fewer workers work than the usual number of workers, then the number of hours required to complete a task is 2 more than the usual time but 7 less than the number of hours required if one-third of the workers were absent. How many hours will be required to complete the work, if 20 more workers than the usual number of workers are assigned?

- $4\frac{1}{2}$
- 12
- $13\frac{1}{2}$
- Cannot be determined

Explanation:

Let 'x' workers take 'h' hours.

So, if one-third are absent, the rest will take $\frac{3h}{2}$ hours

So, x – 6 workers take h + 2 hours which is equal to $\frac{3h}{2} - 7$.

So, $\frac{h}{2} = 9$. So h = 18

So, x – 6 workers take 20 hours instead of 18.

So, $\frac{x}{x-6} = \frac{20}{18} \Rightarrow x = 60$

So, if 20 more workers are appointed, they will take $\frac{18 \times 60}{80} = \frac{27}{2} = 13\frac{1}{2}$ hours.

Hence, [3].

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **128 secs**

Your Attempt: **Skipped**

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

A metallic solid is made up of a cylindrical base of radius 5 cm and conical top with the base of radius 5 cm. The ratio of heights of cylinder and cone is 3 : 2. A cylindrical hole is drilled through the metallic solid from the bottom with height two-third the height of the metallic solid. What should be the radius of the hole, so that the volume of the hole is one-third the volume of the metallic solid after drilling?

- $\sqrt{45}$ cm
- $\sqrt{\frac{55}{8}}$ cm
- $\sqrt{35}$ cm
- $\sqrt{65}$ cm

Explanation:

Let the height of cylinder and cone be 9h and 6h respectively.

Volume of the cylinder = $\pi \times 5 \times 5 \times 9h = 225\ \pi h$

Volume of the cone = $\frac{1}{3} \times \pi \times 5 \times 5 \times 6h = 50\pi h$

Total volume = $275\pi h$

The height of the cylindrical hole = $\frac{2}{3} \times 15h = 10h$

Volume of the cylindrical hole = $\pi \times r^2 \times 10h$

Given : $(275\pi h) \times \frac{1}{4} = \pi \times r^2 \times 10h$

$r^2 = \frac{275}{40}$

$r^2 = \frac{55}{8}$

$r = \sqrt{\frac{55}{8}}$ cm

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **258 secs**

Your Attempt: **Skipped**

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

Find the remainder when (3! + 6! + 12! + 24! + 48! + 96!) is divided by 66.

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

01:23

Explanation:

66 = 2 × 3 × 11, therefore, any factorial greater than 11 will be divisible by 66.

Thus, the last 4 terms of the given expression (3! + 6! + 12! + 24! + 48! + 96!) give a remainder 0 when divided by 66.

Now, the first two terms sum up to 3! + 6! = 6 + 720 = 726 = 66 × 11 which is also divisible by 66. The overall remainder is, therefore, 0.

Therefore, the required answer is 0.

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

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

The digits of a two-digit number are interchanged and twice the resultant number is subtracted from the original number. If the result obtained is 13, what can be said about the original number?

- It is a perfect square.
- It is a prime number.
- It is an even number.
- None of the above.

Oops, you got it wrong!

01:51

Explanation:

Let the two-digit number be $(10x + y)$.

The number after interchanging the digits = $(10y + x)$

By the given condition,

$(10x + y) – 2(10y + x) = 13$

$\Rightarrow 8x – 19y = 13$

Both x and y must be single digits. Also $x > 0$

The only values which satisfy the above condition are $x = 4$ and $y = 1$.

The original number is therefore 41, which is prime. Hence, [2].

Correct Answer:

Time taken by you: **1070 secs**

Avg Time taken by all students: **134 secs**

Your Attempt: **Wrong**

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

A special sugar solution with 'n'% concentration (called as 'n'% sugar solution) is the one in which the weight of sugar in the solution is n% that of water. (For example, a 10% sugar solution is a solution of water and sugar such that the weight of sugar in the solution is 10% that of water.) When the sugar solution is heated, only water from the solution evaporates and sugar remains unaffected. On heating a 10% sugar solution of initial weight 1 kg, we get a sugar solution with weight 0.4 kg. What is the concentration of the solution now?

- 32%
- 29.4%
- 18.2%
- 22.2%

Explanation:

In a 10% sugar solution, if weight of water = 100gm, weight of sugar = 10 gm and the weight of the solution = 100 + 10 = 110 gm.

$\therefore$ Weight of sugar in the solution = $\frac{1}{11}$ times the weight of water.

$\therefore$ Weight of sugar in the solution with weight 1 kg = $\frac{1}{11}$ kg.

After heating, the weight of solution = 0.4 kg = $\frac{2}{5}$ kg

$\therefore$ Weight of water = $\frac{2}{5} - \frac{1}{11} = \frac{17}{55}$ kg.

$\therefore$ Required percentage = $\frac{1}{11} \times \frac{55}{17} \times 100 = 29.4\%$.

Hence, [2].

Correct Answer:

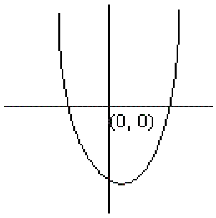
Time taken by you: **0 secs**

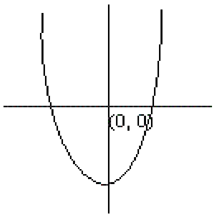
Avg Time taken by all students: **117 secs**

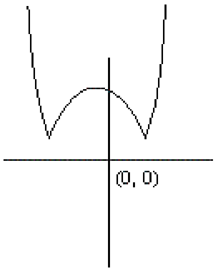
Your Attempt: **Skipped**

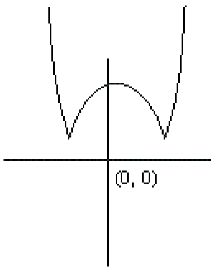
% Students got it correct: **52 %**

$f(x) = |x^2 + x - 6| + \frac{3}{2}$. Which of the following correctly represents f(x)?









Explanation:

$f(x) = |x^2 + x - 6| + \frac{3}{2} = |(x + 3)(x - 2)| + \frac{3}{2} \geq \frac{3}{2}$ (as $|a| \geq 0$)

Hence, options [1] and [2] get eliminated.

Now, for $x = -3$ and $x = 2$, $f(x) = 0 + \frac{3}{2} = \frac{3}{2}$.

i.e., $f(x)$ attains minimum value of $\frac{3}{2}$ at $x = -3$ and $x = 2$.

In option [3] the point where the minimum value of the graph is attained at +ve value of x (i.e., x = 2) is closer to y-axis than the point where the minimum value of the graph is attained at –ve value of x (i.e., x = –3).

Hence, [3].

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **83 secs**

Your Attempt: **Skipped**

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

If f(a + b) = f(a) f(b) and f(0) ≠ 0 for any value of 'a' and 'b'. f(–10) = 5, what is f(20)?

- 10
- $\frac{1}{10}$
- $\frac{1}{25}$
- None of these

Explanation:

$f(a) = f(a + 0) = f(a)\, f(0)$

Thus, $f(0) = 1$

$f(0) = f[10 + (-10)] = f(10)\, f(-10) = f(10) \times 5 = 1$

Thus, $f(10) = \frac{1}{5}$

$f(20) = f(10 + 10) = f(10)\, f(10) = \frac{1}{5} \times \frac{1}{5} = \frac{1}{25}$

Hence, [3].

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **114 secs**

Your Attempt: **Skipped**

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

Find the real solution for x in the equation

$$\frac{x^3 + 3x}{3x^2 + 1} = \frac{341}{91}$$

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

Video Explanation:

Explanation:

Using componendo and dividendo, we get

$$\frac{x^3+3x+3x^2+1}{x^3+3x-3x^2-1} = \frac{341+91}{341-91}$$

$$\Rightarrow \frac{(x+1)^3}{(x-1)^3} = \frac{432}{250} = \frac{216}{125} = \left(\frac{6}{5}\right)^3$$

$$\Rightarrow \frac{x+1}{x-1} = \frac{6}{5} \Rightarrow 5x + 5 = 6x - 6$$

$$\Rightarrow x = 11.$$

Therefore, the required answer is 11.

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

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

$f(x_n) = \log(1 + x_n) - \log(1 - x_{n+1})$

$$10^k = \frac{x_3 - x_1 + x_1 x_3 - 1}{x_2^2 - 1}$$

Find 'k'.

- $f(x_1) - f(x_2)$
- $f(x_1) \times f(x_2)$
- $f(x_2) - f(x_3)$
- $\dfrac{f(x_2)}{f(x_1)}$

03:47

Explanation:

$f(x_n) = \log(1 + x_n) - \log(1 - x_{n+1})$ can be expressed as

$$f(x_n) = \log\left(\frac{1 + x_n}{1 - x_{n+1}}\right)$$

$$\text{Now, } k = \log\left(\frac{x_3 - x_1 + x_1 x_3 - 1}{x_2^2 - 1}\right)$$

$$= \log\frac{x_3(1 + x_1) - 1(1 + x_1)}{x_2^2 - 1}$$

$$= \log\frac{(1 + x_1)(x_3 - 1)}{(1 + x_2)(x_2 - 1)}$$

$$= \log\frac{(1 + x_1)(1 - x_3)}{(1 + x_2)(1 - x_2)}$$

$$= \log\frac{(1 + x_1)}{(1 - x_2)} - \log\left(\frac{1 + x_2}{1 - x_3}\right)$$

Correct Answer:

Time taken by you: **0 secs**

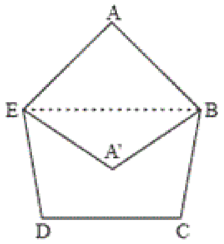
Avg Time taken by all students: **162 secs**

Your Attempt: **Skipped**

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

Change Section here ▼

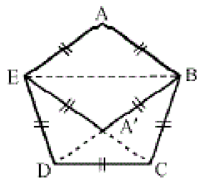
A sheet of paper in the shape of a regular pentagon ABCDE is folded along line EB as shown:



Find m∠DA'C + m∠BEA'.

- 136°
- 108°
- 144°
- 112°

Explanation:



$\Delta AEB \cong \Delta A'EB$ ... (By SSS test)

$m\angle EAB = 108° = m\angle EA'B$

ΔAEB (and hence $\Delta A'EB$) is an isosceles triangle ($AB = AE$)

$\therefore m\angle AEB = m\angle ABE = m\angle BEA' = m\angle EBA' = 36°$

$\therefore m\angle DEA' = 36°$

$\Delta A'ED$ is an isosceles triangle

$$\therefore m\angle EDA' = m\angle EA'D = \frac{180 - 36}{2} = \frac{144}{2} = 72°$$

Now, $m\angle DA'B = m\angle DA'E + m\angle EA'B = 180°$

i.e., D, A' and B are collinear.

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

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

Change Section here ▼

How many ordered pairs of two numbers (x, y) satisfy the following condition?

$10x + y > x^y$, where x and y are single digit natural numbers.

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

Explanation:

For $y = 1$, $10x + 1 > x^1$, for $x = 1, 2, \ldots, 9$ i.e., 9 values

For $y = 2$, $10x + 2 > x^2$, for $x = 1, 2, \ldots, 9$ i.e., 9 values

For $y = 3$, $10x + 3 > x^3$, for $x = 1, 2, 3$ i.e., 3 values

For $y = 4$, $10x + 4 > x^4$, for $x = 1$ and 2 i.e., 2 values

For $y = 5$, $10x + 5 > x^5$, for $x = 1$ i.e., 1 value

For $y = 6$ to 9, $10x + y > x^y$, only for $x = 1$ i.e., 4 values

Therefore, there are 28 numbers satisfying the given condition.

Therefore, the required answer is 28.

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **66 secs**

Your Attempt: **Skipped**

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

Rakesh, Sameer and Trishna started a business by investing Rs. 2,000, Rs. 2,500 and Rs. 3,000 respectively. At the end of four months, Rakesh and Sameer invested Rs. 500 and Rs. 1,000 more respectively, while Trishna withdrew some amount. If at the end of 1 year, the profit sharing ratio of Rakesh, Sameer and Trishna is 14 : 19 : 13, then how much money did Trishna invest for the last 8 months of the year?

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

Explanation:

Let Trishna withdrew Rs. X after 4 months.

So, Profit distribution can be given by:

Rakesh’s investement : 2000 × 12 + 500 × 8 = 28000

Sameer’s investement : 2500 × 12 + 1000 × 8 = 38000

Trishna’s investment = 3000 × 12 – 8x = 36000 – 8x

So, if the profit distribution among Rakesh and Trishna is 14 : 13, then $\frac{28000}{36000-8X} = \frac{14}{13}$

∴ X is 1250

Hence, for last 8 months Trishna invested Rs.1750.
Therefore, the required answer is 1750.

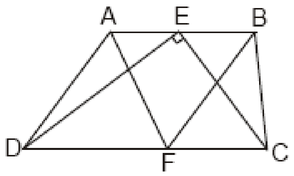
Correct Answer:

Time taken by you: **1569 secs**

Avg Time taken by all students: **135 secs**

Your Attempt: **Skipped**

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



In the figure given above, AB || DC and ABFD is a rhombus. ∠DEC is a right angle. DE = 8 units, EC = 6 units and area of □ABCD = 38.4 sq. units. Then, area of □ABFD is:

- 18 sq. units
- 20.8 sq. units
- 9.6 sq. units
- 28.8 sq. units

Explanation:

$A(\square ABCD) = \frac{1}{2} \times (DC + AB) \times \text{height}$

$\therefore 38.4 = \frac{1}{2}(10 + AB) \times \text{height}$

$[\because (DC)^2 = (DE)^2 + (CE)^2 = (8)^2 + (6)^2 = 100 \therefore DC = 10]$

$\therefore 76.8 = (10 + AB) \times \text{height}$ ... (i)

Now, $A(\Delta DEC) = \frac{1}{2} \times DC \times \text{height} = \frac{1}{2} \times 6 \times 8$

$\Rightarrow$ height = 4.8 units

$\because$ Heights of Δ DEC and $\square$ABCD are same

$\Rightarrow$ Height of $\square$ABCD

= Height of $\square$ABFD = 4.8 units ... (ii)

$\therefore$ From (i) and (ii)

$76.8 = (10 + AB) \times 4.8$

$\therefore 10 + AB = 16$

$\therefore AB = 6$ units

$A(\square ABFD) = AB \times \text{height} = 6 \times 4.8 = 28.8$ sq. units.

Hence, [4].

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

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

A wall is to be built on the moon. One person starts working on the first day with certain efficiency. On the second day, he is joined by one more person and both work with twice the efficiency as that of the first person on the first day. On the third day, one more person joins the work and all the three work with thrice the efficiency as that of the first person on the first day. This process continues and the wall is finally built in ‘n’ days. Instead, if ‘n’ persons had worked together on building the wall with uniform efficiency equal to that of the first person on the first day (as mentioned earlier), the wall could have been built in $15\frac{1}{6}$ days. What is the value of ‘n’?

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

Explanation:

Suppose the first person completes one units on the first day.

Therefore two persons complete two units each on the second day and the number of units completed on the second day = $2^2 = 4$.

Similarly three persons complete three units each on the third day and the number of units completed on the third day = $3^2 = 9$

Therefore the total number of units required to be completed for building the wall

$$= 1^2 + 2^2 + 3^2 + \ldots + n^2 = \frac{n(n+1)(2n+1)}{6}$$

If 'n' persons had completed one unit in one day, the number of days required

$$= \frac{n(n+1)(2n+1)}{6n} = \frac{(n+1)(2n+1)}{6}$$

$$\therefore \frac{(n+1)(2n+1)}{6} = 15\frac{1}{6} = \frac{91}{6}$$

$\therefore$ $(n + 1)(2n + 1) = 91$

$\therefore$ $2n^2 + 3n + 1 = 91$

$\therefore$ $2n^2 + 3n - 90 = 0$

Correct Answer:

Time taken by you: **0 secs**

Avg Time taken by all students: **83 secs**

Your Attempt: **Skipped**

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

Solution A contains water and milk in the ratio 7 : 13. Solution B contains milk and water in the ratio 3 : 2. These two solutions are mixed to get a solution of milk and water containing 37% water. What percentage of final mixture is the solution B?

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

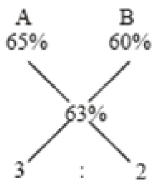
%

Explanation:

Given that final solution has 37% water i.e., remaining 63% milk

In vessel A, % milk is $\frac{13}{20} \times 100 = 65\%$

In vessel B, % milk is $\frac{3}{5} \times 100 = 60\%$



Therefore, the percentage of mixture B in the final mixture $= \frac{2}{2+3} \times 100 = 40\%$.

Therefore, the required answer is 40.

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

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

The product of the marks obtained by 5 students is 32. What can be the maximum and minimum possible average of the marks of the five students if each of them obtained positive integral marks?

- 6.8, 3
- 9.1, 2.5
- 7.2, 2
- 8, 1.5

Explanation:

Let p, q, r, s and t be the respective marks obtained by the five students;
then p × q × r × t = 32 … (i)

To maximise p + q + r + s + t, one of p, q, r, s or t must take the maximum possible value and the others the least.
Let p = q = r = s = 1 and t = 32.
Thus, the maximum value of p + q + r + s + t = 1 + 1 + 1 + 1 + 32 = 36.

To minimise p + q + r + s + t, each of p, q, r, s and t must take the value closest to $\sqrt[5]{32} = 2$ such that (i) is satisfied.

Let p = q= r = s = t = 2.

Then, the minimum value of p + q + r + s + t = 2 + 2 + 2 + 2 + 2 = 10

The maximum and minimum average of marks are 7.2 and 2 respectively.

Hence, [3].

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

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

Anand knows that $(x^3 + mx^2 + nx + k)$ is divisible by $(x – p)$ if $p^3 + mp^2 + np + k = 0$. He is told to find the value of $(b + c)$ using the information that $a^3 + a^2 + ba + 1$ is divisible by $(a – 1)$ and $a^3 – 4a^2 + ca – 3$ is divisible by $(a – 3)$. What is Anand's answer?

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

Explanation:

$a^3 + a^2 + ba + 1$ is divisible by $(a - 1)$.

$\therefore$ $a = 1$ satisfies the equation $a^3 + a^2 + ba + 1 = 0$.

$\therefore$ $1 + 1 + b + 1 = 0 \Rightarrow b = -3$

Similarly, putting $a = 3$ in $a^3 - 4a^2 + ca - 3 = 0$, we get, $27 - 36 + 3c - 3 = 0$

$\therefore$ $3c = 12$

$\therefore$ $c = 4$

$\therefore$ $(b + c) = 1$.

Correct Answer:

Time taken by you: **0 secs**

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

Your Attempt: **Skipped**

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