CAT 2019 Question Paper with Solution
Slot 1 QA

1. In a class, 60% of the students are girls and the rest are boys. There are 30 more girls than boys. If 68% of the students, including 30 boys, pass an examination, the percentage of the girls who do not pass is

Answer: 20

Solution:

Let, the total number of students be 100S.

So, girls = 60S and boys = 40S

Given, 60S – 40S = 30 or S = 1.5

So, we can form the following table:

	Girls	Boys	Total
Passed	72	30	102
Failed	18	30	48
Total	60S=90	40S=60	100S=150

So, percentage of girls who did not pass = 18/90 x 100 = 20%

###TOPIC###Quantitative Aptitude||Arithmetic||Percentages###

2. If $(5.55)^x = (0.555)^y = 1000$, then the value of $\frac{1}{\square} - \frac{1}{\square}$ is

A. 1

B. $\frac{1}{3}$

C. $\frac{2}{3}$

D. 3

Answer: B

Solution:

$(5.55)^x = (0.555)^y = 1000$

Taking log with respect to the base 10 on each side, we will get,

$$\square\square\square\square(5.55) = \square\ \square\square\square(0.555) = \square\square\square 1000 = \square\square\square 10^3 = 3$$

$$\square = \frac{3}{\square\square\square\ (5.55)}, \square\ = \frac{3}{\square\square\square(0.555)}$$

So, $\frac{1}{\square} - \frac{1}{\square} = \frac{\square\square\square(5.55)}{3} - \frac{\square\square\square\ (0.555)}{3} = \frac{\square\square\square(5.55) - \square\square\square(0.555)}{3} = \frac{1}{3} \times \square\square\square\ \left(\frac{5.55}{0.555}\right) = \frac{1}{3}\square\square\square\ (10) = \frac{1}{3}$

###TOPIC###Quantitative Aptitude||Number System||Indices and Surds###

3. With rectangular axes of coordinates, the number of paths from (1,1) to (8,10) via (4,6), where each step from any point (x,y) is either to (x,y+1) or to (x+1,y) is

Answer: 3920

Solution:

(1,1) to (4,6) means 3 steps to the right and 5 steps up.

These can be done in $\frac{8!}{(3!)(5!)} = 56$ □□□□

Similarly, from (4,6) to (8,10) is 4 places right and 4 places up.

No.of ways = $\frac{8!}{(4!)(4!)} = 70$

Total possibilities = 70 x 56 = 3920.

###TOPIC###Quantitative Aptitude||Co-ordinate Geometry||Co-ordinate Geometry###

4. A club has 256 members of whom 144 can play football, 123 can play tennis, and 132 can play cricket. Moreover, 58 members can play both football and tennis, 25 can play both cricket and tennis, while 63 can play both football and cricket. If every member can play at least one game, then the number of members who can play only tennis is

Answer: 43

Solution:

Let, F denote the set of all players who can play football.

Similarly, T is for tennis and C is for cricket.

Given, n(F)=144, n(T) 123 and n(C) = 132

N(F & T) = 58

N(F&C)=63

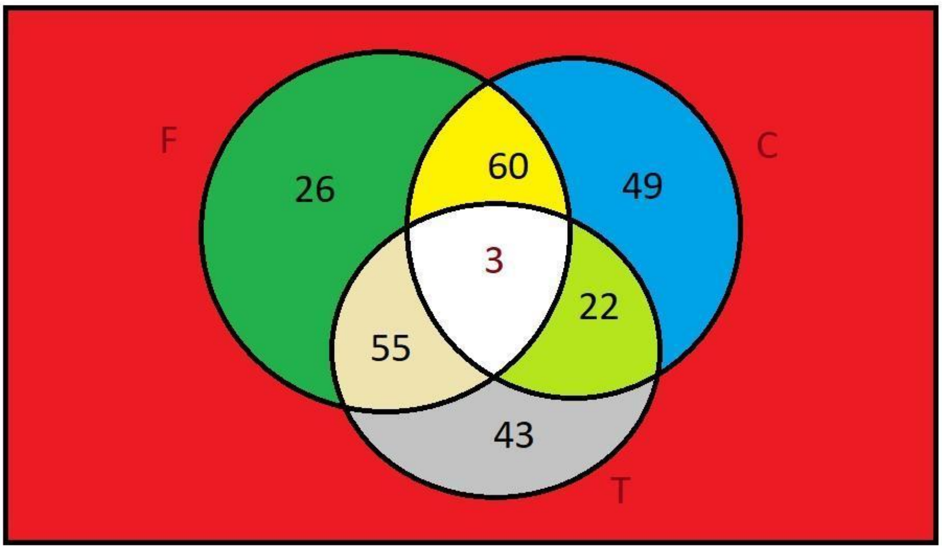
N(T&C)=25

N(F&T&C)=x (let)

As every member can play at least 1 game,

144+123+132 − 58 − 63 − 25 + x= 256

On solving, we will get, x = 3



###TOPIC###Quantitative Aptitude||Set Theory||Set Theory###

5. In a circle of radius 11 cm, CD is a diameter and AB is a chord of length 20.5 cm. If AB and CD intersect at a point E inside the circle and CE has length 7 cm, then the difference of the lengths of BE and AE, in cm, is

A. 1.5
B. 3.5
C. 0.5
D. 2.5

Answer: C

Solution:

Since radius is 11 cm and CD is a diameter, CD = 22 cm

Since CE = 7 cm, , ED = 15 cm

Let, AE be L cm

So, BE = (20.5 – L) cm

Since chords intersect each other such that the intercepted parts will have the same product, we can write, 7x 15 = L (20.5 – L)

Solving, we will get, L = 10 or 10.5

So, 20.5 – L = 10.5 or 10

So, the required difference is 0.5 cm.

###TOPIC###Quantitative Aptitude||Geometry||Circle###

6. Meena scores 40% in an examination and after review, even though her score is increased by 50%, she fails by 35 marks. If her post-review score is increased by 20%, she will have 7 marks more than the passing score. The percentage score needed for passing the examination is

A. 75
B. 80
C. 60
D. 70

Answer: D

Solution:

Let us assume that the full marks are 100M.

So, Meena got 40M.

Under review, marks increased by 50% of 40M = 20M

So, increased marks = 60M

So, pass marks = 60M + 35

Post review score increased by 20% of 60M = 12M

So, final marks = 72M

So, passing marks = 72M - 7

So, 60M + 35 = 72M – 7

12M = 42
60M = 210 and M = 3.5
Pass marks = 60M + 35 = 210+35=245
Full marks =100M = 350
Pass percentage = $\frac{245}{350} \times 100\% =$ 70%.

###TOPIC###Quantitative Aptitude||Arithmetic||Percentages###

7. Corners are cut off from an equilateral triangle T to produce a regular hexagon H. Then, the ratio of the area of H to the area of T is

A. 5 : 6
B. 3 : 4
C. 2 : 3
D. 4 : 5

Answer: C

Solution:

The side of the hexagon will be one-third of the side of the equilateral triangle.

Let us assume that the side of the hexagon is H.

So, the side of the equilateral triangle = 3H

Area of the hexagon = $\frac{\square^2 3\sqrt{3}}{2}$

And that of the equilateral triangle = $\frac{(3\square)^2\sqrt{3}}{4} = \frac{\square^2 9\sqrt{3}}{4}$

So, the ratio 2:3.

###TOPIC###Quantitative Aptitude||Geometry||Lines, Angles, Triangles###

8. Let T be the triangle formed by the straight line 3x + 5y - 45 = 0 and the coordinate axes. Let the circumcircle of T have radius of length L, measured in the same unit as the coordinate axes. Then, the integer closest to L is

Answer: 9
Solution:

The given equation is 3x + 5y – 45 = 0…………….(1)

Equation of the X axis is y = 0…………………………..(2)

Equation of the Y axis is x = 0 …………………………..(3)

Solving (1) and (2), we will get, x = 15

Solving (1) and (3), we will get, y = 9

We will get a right-angled triangle with sides 15 units and 9 units.

So, using Pythagoras' Theorem, the length of the hypotenuse = 17.49 units

So, circum radius = 17.49/2 = 8.75 units

So, the nearest integer will be 9

###TOPIC###Quantitative Aptitude||Geometry||Lines, Angles, Triangles###

9. For any positive integer n, let f(n) = n(n + 1) if n is even, and f(n) = n + 3 if n is odd. If m is a positive integer such that 8f(m + 1) - f(m) = 2, then m equals
Answer: 10

Solution:

We can form the following table:

Case	M	m+1	f(m)	f(m+1)	8f(m+1)	8f(m+1)-f(m)	Eqn	Soln
1	Even	Odd	m(m+1)	m+4	8m+32	$7m+32-m^2$	$7m+32-m^2=2$	10,-3
2	Odd	Even	3+m	(m+1)(m+2)	8(m+1)(m+2)	8(m+1)(m+2)-3-m	8(m+1)(m+2)-3-m=2	No inte

So, 10 is the only possible solution.

###TOPIC###Quantitative Aptitude||Functions and Graphs||Functions and Graphs###

10. If the population of a town is p in the beginning of any year then it becomes 3+2p in the beginning of the next year. If the population in the beginning of 2019 is 1000, then the population in the beginning of 2034 will be

A. $(1003)^{15} + 6$

B. $(977)^{15} - 3$

C. $(1003)2^{15} - 3$

D. $(977)2^{14} + 3$

Answer: C

Solution:

We can form the following table:

Beginning of	Population
2019	1000
2020	2x1000+3
2021	2x(2x1000+3)+3
2022	2x(2x(2x1000+3)+3)+3
....	....
2019+R	2^Rx1000+3(1+2+2^2+…+2^{R-1})

Now, we can simplify that as follows:

2^Rx1000+3(1+2+2^2+…+2^{R-1})

=2^Rx1000+3(2^R – 1)

= (1003)x2^R – 3

For 2034, R = 15

Putting this, we get, C is the correct answer.

###TOPIC###Quantitative Aptitude||Progression||Sequence & Series###

11. A person invested a total amount of Rs 15 lakh. A part of it was invested in a fixed deposit earning 6% annual interest, and the remaining amount was invested in two other deposits in the ratio 2 : 1, earning annual interest at the rates of 4% and 3%, respectively. If the total annual interest income is Rs 76000 then the amount (in Rs lakh) invested in the fixed deposit was

Answer: 900000
Solution:

Let the deposits be 100A, 200B, and 100B respectively.

So, that 100A+300B = 1500000

Cancelling 100 from both sides, we will get,

A+3B = 15000……………..(1)

We can form the following table:

Case	Principal	Time (year)	Rate	Interest
FD	100A	1	6	6A
Dep 1	200B	1	4	8B
Dep 2	100B	1	3	3B
Total	15L	---	----	6A+ 11B

So, 6A+11B = 76000 ……………..(2)

From (1), A = 15000 – 3B …………..(3)

Substituting this in (2), we will get

90000 – 18B + 11B = 76000

B = 2000

From (3) , A = 9000

Invested in the FD = 900000= 9 Lakh.

###TOPIC###Quantitative Aptitude||Arithmetic||Interest (Simple and Compound)###

12. The product of two positive numbers is 616. If the ratio of the difference of their cubes to the cube of their difference is 157 : 3, then the sum of the two numbers is

A. 50
B. 85
C. 95
D. 58

Answer: A

Solution:

Let, the two numbers be A and B.

So, AB = 616 ……………(1)

Also, $\frac{\square^3-\square^3}{(\square-\square)^3} = \frac{\square^2+\square\square+\square^2}{(\square-\square)^2} = \frac{157}{3}$

OR, Simplifying, we will get,

$A^2+B^2=1268$…………(2)

Now, $(A+B)^2=A^2+2AB+B^2=2500=(50)^2$

So, the sum is 50.

###TOPIC###Quantitative Aptitude||Arithmetic||Ratio and Proportion###

13. On selling a pen at 5% loss and a book at 15% gain, Karim gains Rs. 7. If he sells the pen at 5% gain and the book at 10% gain, he gains Rs. 13. What is the cost price of the book in Rupees?

A. 80
B. 85
C. 100
D. 95

Answer: A

Solution:

Let, the cost price of the book be Rs. 100B and that of the pen be Rs. 100P.

So, 95P + 115B = (100P+100B)+7…………..(1)

And 105P + 110B = (100P+100B)+13………(2)

From (1), 15B = 5P + 7 ……………..(3)

From (2), 5P + 10B = 13…………..(4)

Adding (3) and (4), we get,

25B = 20

100B = 80

###TOPIC###Quantitative Aptitude||Arithmetic||Profit, Loss and Discount###

14. Two cars travel the same distance starting at 10:00 am and 11:00 am, respectively, on the same day. They reach their common destination at the same point of time. If the first car travelled for at least 6 hours, then the highest possible value of the percentage by which the speed of the second car could exceed that of the first car is

A. 20
B. 10
C. 35
D. 25

Answer: A

Solution:

Let, the speed of the first car be 100V.

So, the speed of the second car = (100+R)V

Let, time taken by the first car be T hours.

So, the time taken by the second car = (T − 1) hours

So, 100VT = (100+R)V(T − 1)

100T= 100T − 100 + RT − R
R(T - 1) =100
R = 100/(T − 1)
Substituting T = 6, R = 20.

###TOPIC###Quantitative Aptitude||Arithmetic||Speed, Time and Distance###

15. At their usual efficiency levels, A and B together finish a task in 12 days. If A had worked half as efficiently as she usually does, and B had worked thrice as efficiently as he usually does, the task would have been completed in 9 days. How many days would A take to finish the task if she works alone at her usual efficiency?

A. 18
B. 12
C. 24
D. 36

Answer: A

Solution:

Let, A’s usual efficiency be 2a units of work per day.

Also let, B’s usual efficiency be b units of work per day.

So, total work = 12(2a+b) units

And 9(a+3b) = 12(2a+b)

3(a+3b)= 4(2a+b)

3a+9b = 8a + 4b

We get, a = b

So, A will take $\frac{12(2□+□)}{2□} = \frac{6(3□)}{□} = 18$ □□□□

###TOPIC###Quantitative Aptitude||Arithmetic||Time and Work###

16. If $a_1 + a_2 + a_3 + \ldots + a_n = 3(2^{n+1} - 2)$, then a_{11} equals

Answer: 6144

Solution:

Sum up to the 10^{th} term $= 3(2^{11} - 2)$

And the sum up to the 11^{th} term $= 3(2^{12} - 2)$

So, the 11 th term $= 3(2^{12} - 2) - 3(2^{11} - 2) = 3(2^{12} - 2 - 2^{11} + 2) = 3(2^{11}) = 6144$

###TOPIC###Quantitative Aptitude||Progression||Sequence & Series###

17. The number of the real roots of the equation $2\cos(x(x + 1)) = 2^x + 2^{-x}$ is

A. 0
B. Infinite
C. 1
D. 2

Answer: C

Solution:

$2^x + 2^{-x}$ has the minimum value of 2.

Max value of cos of any angle is 1.

So, the equation is valid only for $x = 0$

Hence, C is the correct answer.

###TOPIC###Quantitative Aptitude||Trigonometry||Trigonometry###

18. The income of Amala is 20% more than that of Bimala and 20% less than that of Kamala. If Kamala's income goes down by 4% and Bimala's goes up by 10%, then the percentage by which Kamala's income would exceed Bimala's is nearest to

A. 28
B. 29
C. 31
D. 32

Answer: C

Solution:

A = 1.2B=0.8K or 3B = 2K

Kamala's new income = 0.96K=0.48x2k = 0.48x3B = 1.44B

Bimala's new income = 1.1B

So, Kamala's income is more by 0.34B out of 1.1B

So, percentage = 34/1.1= 31 (approx)

###TOPIC###Quantitative Aptitude||Arithmetic||Percentages###

19. In a race of three horses, the first beat the second by 11 metres and the third by 90 metres. If the second beat the third by 80 metres, what was the length, in metres, of the racecourse?

Answer: 880
Solution:

Let the length of the racecourse be R.

So, when the first covers R meters, the second covers (R – 11) m, and the third covers (R – 90) m.

In the second case, when the second covers R m, the third covers (R – 80) m.

So, $\frac{\square-11}{\square-90} = \frac{\square}{\square-80}$

Solving, we will get,

R= 880 m

###TOPIC###Quantitative Aptitude||Arithmetic||Speed, Time and Distance###

20. One can use three different transports which move at 10, 20, and 30 kmph, respectively. To reach from A to B, Amal took each mode of transport 1/3 of his total journey time, while Bimal took each mode of transport 1/3 of the total distance. The percentage by which Bimal's travel time exceeds Amal's travel time is nearest to

A. 22
B. 19
C. 21
D. 20

Answer: A

Solution:

Let, for Amal , total time taken be 3T and for Bimal, the total distance be 3D x LCM(10,20,30) = 3D x 60 = 180D

We can form the following table:

Mode	Amal			Bimal		
	Time	Speed	Distance	Time	Speed	Distance
1	T	10	10T	6D	10	60D
2	T	20	20T	3D	20	60D
3	T	30	30T	2D	30	60D
Total	3T		60T	11D		180D

Since the total distance is same in both cases,

60T=180D or T = 3D

So, we can redraw the table as follows:

Mode	Amal			Bimal		
	Time	Speed	Distance	Time	Speed	Distance
1	3D	10	30D	6D	10	60D
2	3D	20	60D	3D	20	60D
3	3D	30	90D	2D	30	60D
Total	9D		180D	11D		180D

So, for Bimal, the time is 2D extra than Amal over 9D.

So, the percentage is 22.22%.

###TOPIC###Quantitative Aptitude||Arithmetic||Speed, Time and Distance###

21. Amala, Bina, and Gauri invest money in the ratio 3 : 4 : 5 in fixed deposits having respective annual interest rates in the ratio 6 : 5 : 4. What is their total interest income (in Rs) after a year, if Bina's interest income exceeds Amala's by Rs 250?

A. 7000
B. 6000
C. 6350
D. 7250

Answer: D

Solution:

Since the investments are in the ratio 3:4:5, we can assume the investments as 300P, 400P, 500P.

Similarly, we can assume the rates to be 6R, 5R, 4R respectively.

We can form the following table:

Name	Investment	Rate	Time in year	Interest
Amala	300P	6R	1	18PR
Bina	400P	5R	1	20PR
Gauri	500P	4R	1	20PR
Total				58PR

It is given that 20PR – 18PR = 250 or PR=125

58PR = 7250

###TOPIC###Quantitative Aptitude||Arithmetic||Ratio and Proportion###

22. If m and n are integers such that $(\sqrt{2})^{19}\ 3^4\ 4^2\ 9^m\ 8^n = 3^n\ 16^m\ (\sqrt[4]{64})$ then m is

A. -16
B. -24

C. -12
D. -20

Answer: C

Solution:

$(\sqrt{2})^{19}\ 3^4\ 4^2\ 9^m\ 8^n = 3^n\ 16^m\ (\sqrt[4]{64})$

$(\sqrt{2})^{19}\ 3^4\ 2^4\ 3^{2m}\ 2^{3n} = 3^n\ 2^{4m}\ 2\sqrt{2}$

$3^{4+2m}\ 2^{4+3n+(19/2)} = 3^n\ 2^{4m+(3/2)}$

4+2m=n …………..(1) and 4+3n+(19/2) =4m+(3/2)………….(2)

Putting the value of n in (2), we get,

4 + 3(4 + 2m) + 19/2 = 4m + 3/2

4 + 12+ 6m + 19/2 = 4m + 3/2

2m = -24

-12 = m

###TOPIC###Quantitative Aptitude||Number System||Indices and Surds###

23. A chemist mixes two liquids 1 and 2. One litre of liquid 1 weighs 1 kg and one litre of liquid 2 weighs 800 gm. If half litre of the mixture weighs 480 gm, then the percentage of liquid 1 in the mixture, in terms of volume, is

A. 70
B. 85
C. 80
D. 75

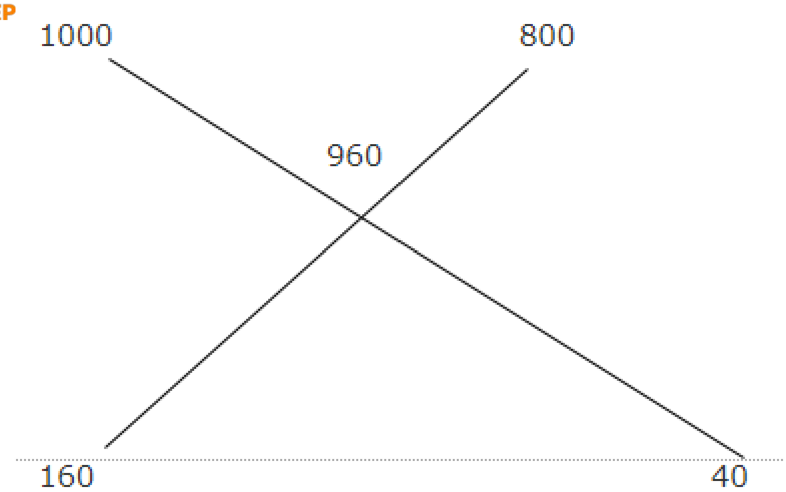
Answer: C

Solution:

Half litre of mixture weighs 480gm.

So, one litre of mixture weighs 960 grams.

We can use alligation as follows:



So, the ratio –160:40 = 4:1

So, liquid 1 is 80%.

###TOPIC###Quantitative Aptitude||Arithmetic||Mixtures and Alligations###

24. Let x and y be positive real numbers such that $\log_5(x + y) + \log_5(x - y) = 3$, and $\log_2 y - \log_2 x = 1 - \log_2 3$. Then xy equals

A. 25
B. 150
C. 250
D. 100

Answer: B

Solution:

$\log_5(x + y) + \log_5(x - y) = 3$.................(1)

$\log_2 y - \log_2 x = 1 - \log_2 3$...............(2)

$$\left(\frac{\square}{\square}\right) = \left(\frac{2}{3}\right)$$

$$3\square = 2\square = 6\square(\square\square\square)$$

Y=2k, x = 3k

Substituting this in (1), we get,

$$5\square + \square = 3$$

$5k^2=5^3=125$

K = 5
x = 15, y = 10
xy = 150

###TOPIC###Quantitative Aptitude||Algebra||Logarithm###

25. If the rectangular faces of a brick have their diagonals in the ratio

3 : 2 √3 : √15, then the ratio of the length of the shortest edge of the brick to that of its longest edge is

A. 1 : √3
B. 2 : √5
C. √2 : √3
D. √3 : 2

Answer: A
Solution:

Let the length, breadth, and height be L, B, and H respectively.

Given, the ratio of the diagonals $= 3 : 2\sqrt{3} : \sqrt{15}$

Squaring, we will get, 9:12:15=3:4:5

We can assume, the squares of the diagonals in the given ratio to be

(L^2+B^2), (B^2+H^2) , (H^2+L^2) respectively.

Let us assume that (L^2+B^2), (B^2+H^2) , and (H^2+L^2) are equal to 3k, 4k, and 5k respectively.

So, $2(L^2+B^2+H^2) = 12k$

$(L^2+B^2+H^2) = 6k$
$L^2 + B^2 = 3k$
$H^2 = 3k$
Similarly, $L^2=2k$ and $B^2=k$
So, required ratio = B:H= $1 : \sqrt{3}$

###TOPIC###Quantitative Aptitude||Geometry||Quadrilateral & Polygons###

26. The number of solutions of the equation $|x|(6x^2 + 1) = 5x^2$ is
Answer: 5

Solution:

$X^2 = |x|^2 = a^2$ (where a = |x|)

So, $a(6a^2+1) = 5a^2$

$6a^3 - 5a^2 + a = 0$

We get, $a(6a^2 - 5a + 1) = 0$

Either $a = 0$ or $(6a^2 - 5a + 1) = 0$

From $(6a^2 - 5a + 1) = 0$

We get, a = 1 or (-1), this will be ignored as a cannot be negative.

Dividing both sides by |x|, [assuming x to be non-zero]

we will get,

$6x^2 - 5|x| + 1 = 0$

Case 1 = $x>0$ or $6x^2 - 5x + 1 = 0$ or $x = 1/3$ or ½

Case 2= $x<0$ or $6x^2 + 5x + 1 = 0$ or -1/2 or -1/3

So, there are five values, that is, ½, -1/2, 1/3, -1/3, and 0.

###TOPIC###Quantitative Aptitude||Algebra||Higher Degree Equations###

27. Three men and eight machines can finish a job in half the time taken by three machines and eight men to finish the same job. If two machines can finish the job in 13 days, then how many men can finish the job in 13 days?

Answer: 13
Solution:

Let, 1 man can do m units of work in 1 day and 1 machine can do 1M units of work in 1 day.

So, (3m+8M)T=(3M+8m)(2T)…………………(1)

where T and 2T are the time taken by the two groups mentioned in the question.

Now, 2Mx13 = 26M = total work …………….(2)

From (1), we will get,

3m+8M = 6M+16m

2M = 13m
We can replace 2 machines by 13 men to finish the job in 13 days.

###TOPIC###Quantitative Aptitude||Arithmetic||Time and Work###

28. The product of the distinct roots of $|x^2 - x - 6| = x + 2$ is

A. -4
B. -16
C. -8
D. -24

Answer: B

Solution:

$|x^2 - x - 6| = x + 2$

⇨ $|(x-3)(x+2)| = x + 2$
⇨ $|x-3|\ |x+2|=x+2$………………(1)

Case 1:

$x+2>0$

$|x-3| = 1$

$x = 2$ or 4

Case 2:

$x+2<0$

$|x-3|=(-1)$, impossible

Case 3:

$x+2=0$

$X = (-2)$

So, product of the distinct root s= (2)(4)(-2) = (-16)

###TOPIC###Quantitative Aptitude||Algebra||Quadratic Equations###

29. The wheels of bicycles A and B have radii 30 cm and 40 cm, respectively. While traveling a certain distance, each wheel of A required 5000 more revolutions than each wheel of B. If bicycle B travelled this distance in 45 minutes, then its speed, in km per hour, was

A. 18п
B. 16п
C. 12п
D. 14п

Answer: B

Solution:

For wheel A, the circumference = 60π

For wheel B, the circumference = $80\ \pi$

Let, B rotated R times.

So, A rotated (R+5000)

So, $60\pi(\square + 5000) = 80\square\square$

3R+15000 = 4R

R = 15000

So, B covered 15000x 80π cm distance in 45 minutes or ¾ hours.

So, speed = 4x5000x 80π cm/hour=1600000□ cm/hour= 16π kmph.

###TOPIC###Quantitative Aptitude||Geometry||Circle###

30. Consider a function $f(x+y) = f(x) f(y)$ where x , y are positive integers, and $f(1) = 2$. If $f(a+1) + f(a+2) + \ldots.. + f(a+n) = 16(2^n - 1)$ then a is equal to.

Answer: 3
Solution:

$f(a+1) = f(a)f(1) = 2f(a)$

Also, $f(2) = f(1+1) = f(1) f(1) = 2^2$

Again, $f(3) = f(2+1) = f(2) f(1) = 2^3$ and so on

So, $f(n) = 2^n$

Now, given that

$f(a+1) + f(a+2) + \ldots.. + f(a+n) = 16(2^n - 1)$

or $2f(a) + 2^2 f(a) + \ldots + 2^n f(a) = 16(2^n - 1)$

$(2+2^2 + \ldots + 2^n) f(a) = 16(2^n - 1)$
$2(2^n - 1) f(a) = 16(2^n - 1)$
$f(a) = 8 = 2^3 = f(3)$
a= 3

###TOPIC###Quantitative Aptitude||Functions and Graphs||Functions and Graphs###

31. Ramesh and Gautam are among 22 students who write an examination. Ramesh scores 82.5. The average score of the 21 students other than Gautam is 62. The average score of all the 22 students is one more than the average score of the 21 students other than Ramesh. The score of Gautam is

A. 51
B. 53
C. 49
D. 48

Answer: A

Solution:

Gautam scored G (let).

Total score of other 21 students = 21 x 62

So, total of all 22 students = 21 x 62 + G

Since Ramesh scored 82.5,

The 20 students other than both Ramesh and Gautam scored 21x62 – 82.5 = 1219.5 in total

21 students other than Ramesh scored a total of 1219.5 + G

So, the average of those 21 students $= \frac{1219.5+\square}{21}$

So, average of all 22 students $= \frac{1219.5+\square}{21} + 1 = \frac{1240.5+\square}{21}$

So, total of all 22 students $= \frac{1240.5+\square}{21} \times 22 = 21 \times 62 + \square$ [found previously]

Solving, we will get, G = 51.

###TOPIC###Quantitative Aptitude||Arithmetic||Averages###

32. If a_1, a_2, ……… are in A.P , $\frac{1}{\sqrt{\square_1}+\sqrt{\square_2}} + \frac{1}{\sqrt{\square_2}+\sqrt{\square_3}} + \cdots + \frac{1}{\sqrt{\square_\square}+\sqrt{\square_{\square+1}}}$

then , is equal to

A. $\frac{\square}{\sqrt{\square_1}+\sqrt{\square_{\square+1}}}$

B. $\frac{\square-1}{\sqrt{\square_1}+\sqrt{\square_\square}}$

C. $\frac{\square}{\sqrt{\square_1}-\sqrt{\square_{\square+1}}}$

D. $\frac{\square-1}{\sqrt{\square_1}+\sqrt{\square_{\square-1}}}$

Answer: A
Solution:

In this AP, let the common difference be d.
So, $\square_{\square} = \square_1 + (\square - 1)\square$

Now, $\frac{1}{\sqrt{\square_\square}+\sqrt{\square_{\square+1}}} = \frac{1}{\sqrt{\square_\square}+\sqrt{\square_{\square+1}}} \times \frac{(\sqrt{\square_{\square+1}}-\sqrt{\square_\square})}{\sqrt{\square_{\square+1}}-\sqrt{\square_\square}} = \frac{\sqrt{\square_{\square+1}}-\sqrt{\square_\square}}{\square}$

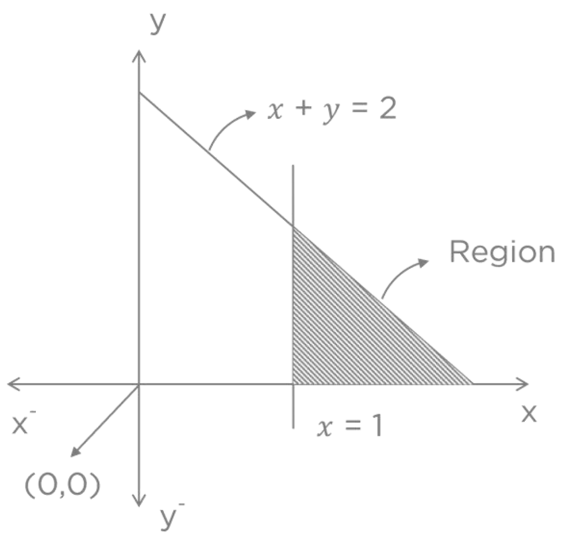
So, the given series will become
$\frac{\sqrt{\square_2}-\sqrt{\square_1}}{\square} + \frac{\sqrt{\square_3}-\sqrt{\square_2}}{\square} + \cdots + \frac{\sqrt{\square_{\square+1}}-\sqrt{\square_\square}}{\square} = \frac{\square(\sqrt{\square_{\square+1}}-\sqrt{\square_1})}{\square\square} = \frac{\square\,(\sqrt{\square_{\square+1}}-\sqrt{\square_1})}{\square_{\square+1}-\square_1}$

Hence, option (A) is the correct answer.

###TOPIC###Quantitative Aptitude||Progression||Arithmetic progression###

33. Let S be the set of all points (x,y) in the x-y plane such that |x| + |y| ≤ 2 and |x| ≥ 1. Then, the area, in square units, of the region represented by S equals

Answer: 2
Solution:



We can see that the shaded region is a right-angled isosceles triangle with equal sides of 1 unit.

So, the area = ½ square units.

Now, this is in the first quadrant.

So, in the other three quadrants also, we will have such areas.

So, the total area = 4x1/2 = 2 square units.

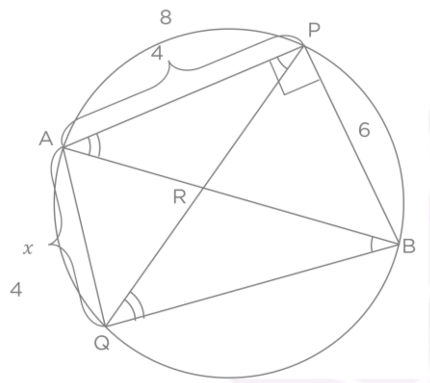
###TOPIC###Quantitative Aptitude||Co-ordinate Geometry||Co-ordinate Geometry###

34. AB is a diameter of a circle of radius 5 cm. Let P and Q be two points on the circle so that the length of PB is 6 cm, and the length of AP is twice that of AQ. Then the length, in cm, of QB is nearest to

A. 8.5
B. 9.3
C. 9.1
D. 7.8

Answer: C

Solution:



In the diagram, we can see that the angle APB is 90 as the semicircular angle is right angle.

So, in right-angled triangle APB, using Pythagoras' Theorem, AP = 8 cm

Since AQ is half of AP, AQ is 4 cm.

Again, in the right-angled triangle AQB, using Pythagoras' Theorem, QB = root (84) or approximately 9.1 cm.

Hence, option (C) is the correct answer.

###TOPIC###Quantitative Aptitude||Geometry||Circle###