CAT 2017 Question Paper with Solution
Slot 1 QA

1. Arun's present age in years is 40% of Barun's. In another few years, Arun's age will be half of Barun's. By what percentage will Barun's age increase during this period?

Answer: 20

Solution:

Let the present age of Barun be 100B years.

So, the present age of Arun = 40B years

Let after T years, Arun’s age will be half of Barun’s age.

So, 2(40B + T) = 100B + T

80B + 2T = 100B + T or T = 20B
So, Barun’s age has increased by 20%.

Hence, 20 is the correct answer.

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

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2. A person can complete a job in 120 days. He works alone on Day 1. On Day 2, he is joined by another person who also can complete the job in exactly 120 days. On Day 3, they are joined by another person of equal efficiency. Like this, everyday a new person with the same efficiency joins the work. How many days are required to complete the job?

Answer: 15

Solution:

Let a person do W work in a day.

Then, total work = 120W

We get the following table:

Day number	Number of persons	Work today	Work till today
1	1	W	W
2	2	2W	3W
3	3	3W	6W
4	4	4W	10W
5	5	5W	15W
6	6	6W	21W
7	7	7W	28W
N	N	NW	NW(N+1)/2

So, if $\frac{NW(N+1)}{2} = 120W$

N(N + 1) = 240 or N = 15

Hence, 15 is the correct answer.

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

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3. An elevator has a weight limit of 630 kg. It is carrying a group of people of whom the heaviest weighs 57 kg and the lightest weighs 53 kg. What is the maximum possible number of people in the group?

Answer: 11

Solution:

To accommodate the maximum number of people, the weight of each person must be the least, that is 53kg.

The elevator has a weight limit of 630 kg and the heaviest person is 57 kg.

So, the remaining persons must weigh (630 – 57) kg at max or 573 kg at max

Now,the maximum number of persons = $\frac{573}{53} = 10\frac{43}{53}$

So, the maximum number of persons weighing 53 kg each is 10 and there is another person who weighs 57 kgs.

Hence, the maximum number of persons in that elevator can be 10 + 1= 11

Hence, 11 is the correct answer.
###TOPIC###Quantitative Aptitude||Arithmetic||Averages###

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4. A man leaves his home and walks at a speed of 12 km per hour, reaching the railway station 10 minutes after the train had departed. If instead he had walked at a speed of 15 km per hour, he would have reached the station 10 minutes before the train's departure. The distance (in km) from his home to the railway station is:

Answer: 20

Solution:

Let the distance be 60D km (LCM (12,15)).

We get the following table:

Case	Distance (km)	Speed (kmph)	Time (H)	Time (min)
Exact	60D	S	T	60T
Early	60D	12	5D	300D = 60T+10...(1)
Late	60D	15	4D	240D = 60T – 10...(2)

From (1) - (2), we get, 300D – 240D = 20

60D = 20

Hence, 20 is the correct answer.

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

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5. Ravi invests 50% of his monthly savings in fixed deposits. Thirty percent of the rest of his savings is invested in stocks and the rest goes into Ravi's savings bank account. If the total amount deposited by him in the bank (for savings account and fixed deposits) is Rs 59,500, then Ravi's total monthly savings (in Rs) is:

Answer: 70,000
Solution:
Let Ravi’s savings = 100S
So, fixed deposit = 50S and remaining = 50S
Stocks= 30% of 50S = 15S
So, savings bank = 50S – 15S = 35S
Total in bank = fixed + savings = 50S + 35S= 85S = 59500 or S = 700
So, total savings = 100S = 70,000

Hence, 70,000 is the correct answer.

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

6. If a seller gives a discount of 15% on retail price, she still makes a profit of 2%. Which of the following ensures that she makes a profit of 20%?

A. Give a discount of 5% on retail price

B. Give a discount of 2% on retail price

C. Increase the retail price by 2%

D. Sell at retail price

Answer: D

Solution:

Let the cost price be 100C and the marked price be 100M.
So, selling price = 100M – 15M = 85M, profit = 2C
So, selling price = 100C + 2C = 102C = 85M
6C = 5M = 30K (let), where K is a non-zero constant.
C = 5K and M = 6K, cost price = 500K and selling price = 600K
As profit is 20%, profit = 100K.
Selling price = cost price + profit = 500K + 100K = 600K
So, there is no discount.
Hence, option (D) is the correct answer.

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

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7. A man travels by a motor boat down a river to his office and back. With the speed of the river unchanged, if he doubles the speed of his motor boat, then his total travel time gets reduced by 75%. The ratio of the original speed of the motor boat to the speed of the river is:

A. √6:√2
B. √7:2
C. 2√5:3
D. 3:2

Answer: B

Solution:

Let the original speed of the motor boat be M units and the speed of the river be R units.

So, downstream speed = D = M + R and upstream speed = U = M − R

Let, the distance be A units.

So, time taken = $\frac{A}{D} + \frac{A}{U} = A\left(\frac{1}{M+R} + \frac{1}{M-R}\right) = 4T(let)$.............(1)

In the second case, M becomes 2M.

So, the time taken will be $A\left(\frac{1}{2M+R} + \frac{1}{2M-R}\right) = T$.............(2)

From (1) and (2), we get, $A\left(\frac{1}{M+R} + \frac{1}{M-R}\right) = 4A\left(\frac{1}{2M+R} + \frac{1}{2M-R}\right)$

$$\left(\frac{1}{M+R} + \frac{1}{M-R}\right) = 4\left(\frac{1}{2M+R} + \frac{1}{2M-R}\right)$$
$$\frac{2M}{M^2-R^2} = \frac{16M}{4M^2-R^2}$$
$$\left(4M^2 - R^2\right) = 8\left(M^2 - R^2\right)$$
$$4M^2 - R^2 = 8M^2 - 8R^2$$
$$7R^2 = 4M^2$$
$$\frac{R^2}{M^2} = \frac{4}{7} = \left(\frac{2}{\sqrt{7}}\right)^2$$

M:R = √7:2

Hence, option (B) is the correct answer.

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

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8. Suppose, C1, C2, C3, C4, and C5 are five companies. The profits made by C1, C2, and C3 are in the ratio 9:10:8 while the profits made by C2, C4, and C5 are in the ratio 18:19:20. If C5 has made a profit of Rs 19 crore more than C1, then the total profit (in Rs) made by all five companies is:

A. 438 crore
B. 435 crore
C. 348 crore
D. 345 crore

Answer: A

Solution:

The corresponding values for C2 are given as 10 and 18. LCM of which is 90.

On combining the ratios, we get C1:C2:C3:C4:C5 = 81:90:72:95:100

C1:C2:C3:C4:C5 = 81K:90K:72K:95K:100K, where K is a non-zero constant.

So, 100K – 81K = 19K = 19 crore (given)

K = 1 crore
Total profit = 438k = 438 crore
Hence, option (A) is the correct answer.
###TOPIC###Quantitative Aptitude||Arithmetic||Ratio and Proportion###

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9. The number of girls appearing for an admission test is twice the number of boys. If 30% of the girls and 45% of the boys get admission, the percentage of candidates who do not get admission is:

A. 35
B. 50
C. 60
D. 65

Answer: D

Solution:

Let there be 100B boys and there are 200B girls.

Now, we get the following table:

	Admitted	Rejected	Total
Girls	30% of 200B=60B	200B – 60B = 140B	200B
Boys	45% of 100B = 45B	100B – 45B = 55B	100B
Total	105B	195B	300B

So, rejected percentage = 195/300 x 100% = 65%

Hence, option (D) is the correct answer.

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

10. A stall sells popcorn and chips in packets of three sizes: large, super, and jumbo. The numbers of large, super, and jumbo packets in its stock are in the ratio 7:17:16 for popcorn and 6:15:14 for chips. If the total number of popcorn packets in its stock is the same as that of chips packets, then the numbers of jumbo popcorn packets and jumbo chips packets are in the ratio:

A. 1:1
B. 8:7
C. 4:3
D. 6:5

Answer: A

Solution:

	Popcorn	Chips
Large	7p	6c

Super	17p	15c
Jumbo	16p	14c
Total	40p	35c

Where p and c are non-zero constants.

Since 40p = 35c

8p = 7c = 56k (let)
p = 7k and c = 8k
Required ratio = 16p:14c = 16x7k:14x 8k = 1:1

Hence, option (A) is the correct answer.

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

11. In a market, the price of medium quality mangoes is half that of good mangoes. A shopkeeper buys 80 kg good mangoes and 40 kg medium quality mangoes from the market and then sells all these at a common price which is 10% less than the price at which he bought the good ones. His overall profit is:

A. 6%.
B. 8%.
C. 10%.
D. 12%.

Answer: B

Solution:

Let the price of medium mangoes be Rs. 100P/kg.

So, the price of good mangoes = Rs. 200P/kg

So, total cost price = 80 x 200P + 40 x 100P = 20000P

Total SP = (200 – 10%) P x (80 + 40) = 180P x 120 = 21600 P

So, there is profit of 1600P over 20000P.

So, percentage = $\frac{1600P}{20000P} \times 100\% = 8\%$

Hence, option (B) is the correct answer.

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

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12. If Fatima sells 60 identical toys at a 40% discount on the printed price, then she makes 20% profit. Ten of these toys were destroyed in a fire. While selling the rest, how much discount should be given on the printed price so that she can make the same amount of profit?

A. 30%
B. 25%
C. 24%
D. 28%

Answer: D

Solution:

Let the printed price for each of the toys be Rs. 100P.

Discount for each toy = Rs 40P and selling price for each toy = Rs. 60P

Profit = 20% of 100C (assuming 100C as the cost price of each toy) = 20C

So, SP = 120C = 60P and P = 2C or printed price = 200C

Now, total cost of all 60 toys = 6000C

Destroyed in fire = 10 and remaining = 50

Overall profit needed = 20% of 6000C = 1200C

Overall selling price = 7200C

Selling price of each of the 50 good toys = 144C

So, discount = printed price – selling price = 200C – 144C = 56C

So, discount percentage = 28%

Hence, option (D) is the correct answer.

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

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13. If a and b are integers of opposite signs such that $(a + 3)^2:b^2 = 9:1$ and $(a - 1)^2:(b - 1)^2 = 4:1$, then the ratio $a^2:b^2$ is:

A. 9:4
B. 81:4
C. 1:4
D. 25:4

Answer: D

Solution:

From the first equation, taking square roots of each side, we will get,

(a+3):b = 3:1 or -3:1 ....(1)

Similarly the second equation, we get, (a-1):(b-1)= 2:1 or -2:1...............(2)

So, we get four sets of equations which are as follows:

Set	First equation	Second equation	Value of a	Value of b
1	(a+3):b = 3:1	(a-1):(b-1) = 2:1	3	2
2	(a+3) :b = -3:1	(a-1):(b-1) = 2:1	-9/5	-2/5
3	(a+3):b = 3:1	(a-1):(b-1) = -2:1	3/5	6/5
4	(a+3):b = -3:1	(a-1):(b-1) = -2:1	15	-6

It is observed that only the last case satisfies the given condition that a and b are integers with opposite signs.

So, a = 15 and b = (-6)

So, the required ratio = $a^2:b^2$ = 225:36 = 25:4

Hence, option (D) is the correct answer.

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

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14. A class consists of 20 boys and 30 girls. In the mid-semester examination, the average score of the girls was 5 higher than that of the boys. In the final exam, however, the average score of the girls dropped by 3 while the average score of the entire class increased by 2. The increase in the average score of the boys is:

A. 9.5.
B. 10.
C. 4.5.
D. 6.

Answer: A

Solution:

Let 'X' denote the average marks scored by boys in mid-semester.

Gender	Mid-semester		
	Number	Avg	total
Girl	30	x+5	30x+150
Boy	20	X	20x
Total	50	x+3	50x+150

In the final exam,

Sum of the girls = 30(x + 2) = 30x + 60

The overall sum of the entire class = 50(x+5) = 50x+250

Sum of the boys = Overall sum – Sum of the girls

Sum of the boys = 50x + 250 – (30x + 60) = 20x +190

So, average for the boys in the final examination will be sum/20 = $\frac{20x+190}{20} = x + 9.5$

So, their average has increased by 9.5.

Hence, option (A) is the correct answer.

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

15. The area of the closed region bounded by the equation | x | + | y | = 2 in the two-dimensional plane is

A. 4π.
B. 4.
C. 8.
D. 2π.

Answer: C

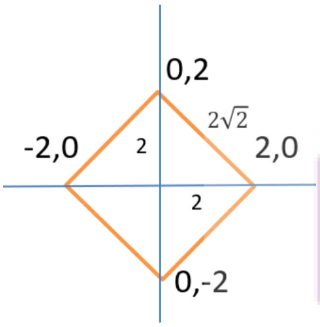
Solution:

Given, | x | + | y | = 2

Considering x = 0, we get y = 2 or -2

Also, y = 0, we get x = 2 or -2

So, the graph will cut the axes at 2 unit distances from the origin.



We can see that the bound region is a square with sides 2√2 units

So, the area is 8 square units.

Hence, option (C) is the correct answer.

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

16. From a triangle ABC with sides of lengths 40 ft, 25 ft and 35 ft, a triangular portion GBC is cut off where G is the centroid of ABC. The area, in sq. ft, of the remaining portion of triangle ABC is:

A. 225√3.
B. 500/√3.
C. 275/√3.
D. 250/√3.

Answer: B

Solution:

For any triangle, if the sides are a, b and c, then the area is
$\sqrt{s(s-a)(s-b)(s-c)}$,

where ‘s’ is the semi perimeter. Here, the semi perimeter is 50 cm.

So, the area is $\sqrt{50\times(50-40)\times(50-25)\times(50-35)}=250\sqrt{3}$.

On joining the vertices of any triangle to the centroid of that triangle, three triangles are formed with equal area.

So, triangle GBC will be one-third of the area of triangle ABC.

So, the area of the triangle GBC is $\frac{250\sqrt{3}}{3}=\frac{250}{\sqrt{3}}$.

Hence, option (D) is the correct answer.

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

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17. Let ABC be a right-angled isosceles triangle with hypotenuse BC. Let BQC be a semi-circle, away from A, with diameter BC. Let BPC be an arc of a circle centered at A and lying between BC and BQC. If AB has a length of 6 cm then the area, in sq. cm, of the region enclosed by BPC and BQC is:

A. 9п - 18

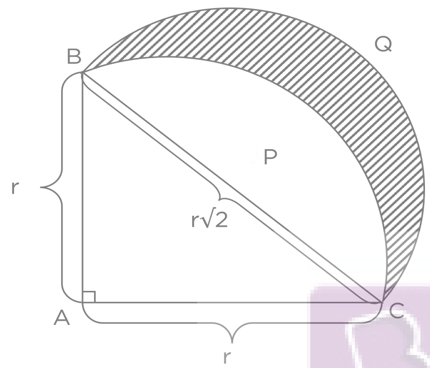
B. 18

C. 9п

D. 9

Answer: B

Solution:



As the side of the triangle is r= 6cm, length of hypotenuse is $6\sqrt{2}$ cm.

So, for the semi circle, the radius $=\frac{6}{\sqrt{2}}$ cm.

So, the area of the semi circle $= \frac{\pi 6^2}{2} \times \frac{1}{2} = 9\pi\ cm^2$

Area of the sector BPCB = Area of the quadrant − Area of the triangle

Area of sector $= \frac{1}{4}\pi 6^2 - \frac{6^2}{2}$

Area of the shaded region is $= 9\pi - \left(\frac{1}{4}\pi 6^2 - \frac{6^2}{2}\right) = \frac{6^2}{2}$ =18

Hence, option (B) is the correct answer.

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

18. A solid metallic cube is melted to form five solid cubes whose volumes are in the ratio 1:1:8:27:27. The percentage by which the sum of the surface areas of these five cubes exceeds the surface area of the original cube is the nearest to:

A. 10.
B. 50.
C. 60.
D. 20.

Answer: B

Solution:

Ratio of the volumes of the 5 new cubes =1:1:8:27:27

So, the ratio of the sides of the 5 new cubes = 1:1:2:3:3 = k: k:2k:3k:3k,

where k is a non-zero constant.

Ratio of the volumes of the 5 new cubes = $k^3:k^3:8\ k^3:27k^3:27k^3$

Total volume = $64k^3$ = Volume of the initial large cube
Side of the initial large cube = 4k
Total surface area of the initial large cube = $6x(4k)^2=96k^2$
Total surface area of all the 5 new smaller cubes =
$6\{k^2 + k^2 + 4k^2 + 9k^2 + 9k^2\} = 6\times24k^2 = 144k^2$
Percentage increase = $\frac{144k^2-96k^2}{96k^2}\times100\% = 50\%$

Hence, option (B) is the correct answer.

###TOPIC###Quantitative Aptitude||Mensuration||Mensuration###

19. A ball of diameter 4 cm is kept on top of a hollow cylinder standing vertically. The height of the cylinder is 3 cm, while its volume is 9π cm^3. Then the vertical distance, in cm, of the topmost point of the ball from the base of the cylinder is:

Answer: 6

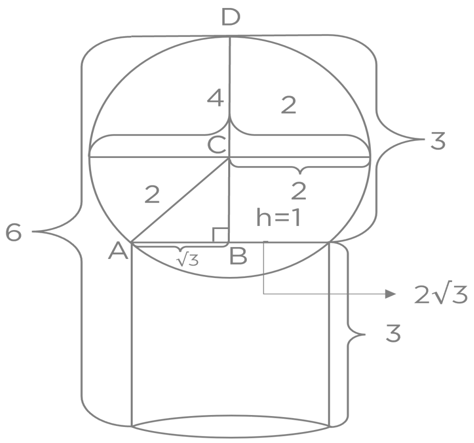
Solution:

Let the radius of the cylinder be r.

Volume = $\pi r^2 h = 9\pi$

As h = 3, then $r = \sqrt{3}$.

So, the diameter of the cylinder will be $2\sqrt{3}$.



From this diagram, we can see that CB is perpendicular to AB.

Using Pythagoras Theorem, we will get, CB = 1m

So, the required height = height of the cylinder + BD = 3+3 = 6m

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Hence, 6 is the correct answer.

###TOPIC###Quantitative Aptitude||Mensuration||Prism & Cylinder###

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20. Let ABC be a right-angled triangle with BC as the hypotenuse. Lengths of AB and AC are 15 km and 20 km, respectively. The minimum possible time, in minutes, required to reach the hypotenuse from A at a speed of 30 km per hour is:

Answer: 24

Solution:

Since the two sides are 15 and 20 km then using Pythagoras theorem, the hypotenuse is 25 km.

Area of the triangle = ½ x Base x Height = ½ x 15 x 20 = 150 square km

So, the length of the perpendicular drawn on the hypotenuse from the right angular vertex is H (let).

So, ½ x 25 x H = 150 or H = 12

So, at a speed of 30 kmph, the time taken will be 12/30 hours = 24 minutes

Hence, 24 is the correct answer.

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

21. Suppose, $\log_3 x = \log_{12} y = a$, where x, y are positive numbers. If G is the geometric mean of x and y, and $\log_6 G$ is equal to:

A. $\sqrt{a}$.
B. 2a.
C. $\frac{a}{2}$.
D. a.

Answer: D

Solution:

Given, $\log_3 x = \log_{12} y = a$

$x = 3^a$ and $y = 12^a$

$G = \sqrt{xy} = \sqrt{3^a \times 12^a} = \sqrt{36^a} = 6^a$

$\log_6 G = a$

Hence, option (D) is the correct answer.

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

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22. If x + 1 = x^2 and x > 0, then $2x^4$ is:

A. $6 + 4\sqrt{5}$.
B. $3 + 5\sqrt{5}$.
C. $5 + 3\sqrt{5}$.
D. $7 + 3\sqrt{5}$.

Answer: D

Solution:

Since x + 1 = x^2 and x > 0

Solving for using formula, we have $x = \frac{1\pm\sqrt{5}}{2}$ or $2x = 1\pm\sqrt{5}$

On squaring both sides, $4x^2 = 6\pm2\sqrt{5}$
Dividing both sides by 2, $2x^2 = 3\pm\sqrt{5}$
Squaring both sides again, $4x^4 = 14\pm6\sqrt{5}$
Dividing both sides by 2 again, $2x^4 = 7\pm3\sqrt{5}$

Hence, option (D) is the correct answer.

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

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23. The value of $\log_{0.008}\sqrt{5} + \log_{\sqrt{3}}81 - 7$ is equal to:

A. 1/3.
B. 2/3.
C. 5/6.
D. 7/6.

Answer: C

Solution:

$\log_{0.008}\sqrt{5} + \log_{\sqrt{3}}81 - 7 =$

$$log_{0.008}5^{\frac{1}{2}} + log_{\sqrt{3}}3^{4} - 7 = \frac{\frac{1}{2}}{-3}log_{5}5 + \frac{4}{\frac{1}{2}}log_{3}3 - 7 = -\frac{1}{6} + 8 - 7 = \frac{5}{6}$$

Hence, option (C) is the correct answer.

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

24. If $9^{2x-1} - 81^{x-1} = 1944$, then x is

A. 3.
B. $\frac{9}{4}$.
C. 4/9.
D. 1/3.

Answer: B

Solution:

$9^{2x-1} - 81^{x-1} = 1944$

$\frac{81^x}{9} - \frac{81^x}{81} = 1944$

$8 \times 81^x = 1944 \times 81$

$81^x = 243 \times 81 = 3^5 \times 3^4 = 3^9$

$3^{4x} = 3^9$

$4x = 9$

$x = 9/4$

Hence, option (B) is the correct answer.

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

25. The number of solutions (x, y, z) to the equation $x - y - z = 25$, where x, y, and z are positive integers such that $x \leq 40$, $y \leq 12$, and $z \leq 12$ is

A. 101.
B. 99.
C. 87.
D. 105.

Answer: B

Solution:

All the possible values of x, y and z will be,

	X	Y		Z		TOTAL
		FROM	TO	FROM	TO	
1	40	3	12	12	3	10
2	39	2	12	12	2	11
3	38	1	12	12	1	12
4	37	1	11	11	1	11
5	36	1	10	10	1	10
6	35	1	9	9	1	9
7	34	1	8	8	1	8
8	33	1	7	7	1	7
9	32	1	6	6	1	6

10	31	1	5	5	1	5
11	30	1	4	4	1	4
12	29	1	3	3	1	3
13	28	1	2	2	1	2
14	27	1	1	1	1	1
						99

Hence, option (B) is the correct answer.
###TOPIC###Quantitative Aptitude||Algebra||Linear Equations###

26. For how many integers n, will the inequality (n – 5) (n – 10) – 3(n – 2) ≤ 0 be satisfied?
Answer: 11
Solution:
Given,
$(n - 5)(n - 10) - 3(n - 2) \leq 0$
$n^2 - 5n - 10n + 50 - 3n + 6 \leq 0$
$n^2 - 18n + 56 \leq 0$
$(n-4)(n-14) \leq 0$
$4 \leq n \leq 14$
There are 14 – 4 + 1 = 11 integers.

Hence, 11 is the correct answer.

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

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27. $f_1(x) = x^2 + 11x + n$ and $f_2(x) = x$, then the largest positive integer n for which the equation $f_1(x) = f_2(x)$ has two distinct real roots, is:
Answer: 24
Solution:
We get, $x^2 + 11x + n = x$

$x^2 + 10x + n = 0$

Since it has two distinct real roots, the discriminant is greater than zero.

So, $10^2 - 4n > 0$ or $25 > n$

So, the largest positive integer value of n is 24.

Hence, 24 is the correct answer.

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

28. If a, b, c, and d are integers such that $a + b + c + d = 30$, then the minimum possible value of $(a - b)^2 + (a - c)^2 + (a - d)^2$ is

Answer: 2.

Solution:

The value will be minimum when the values of a, b, c, d are closest.

So, the values can be (7, 7, 8, 8) in any order.

So, the minimum possible value is $= (7 - 7)^2 + (7 - 8)^2 + (7 - 8)^2 = 2$

Hence, 2 is the correct answer.

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

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29. Let AB, CD, EF, GH, and JK be five diameters of a circle with centre at O. In how many ways, can three points be chosen out of A, B, C, D, E, F, G, H, J, K, and O so as to form a triangle?

Answer: 160

Solution:

There are in total 11 points and any 3 can be selected in $^{11}C_3$ =165 ways.

Selecting AOB, COD, EOF, GOH and JOK does not give triangles.

So, the total acceptable number of ways = 165 – 5 = 160

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

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30. The shortest distance of the point (1/2, 1) from the curve y = |x - 1| + |x + 1| is

A. 1.

B. 0.

C. √2.

D. √(3/2).

Answer: A

Solution:

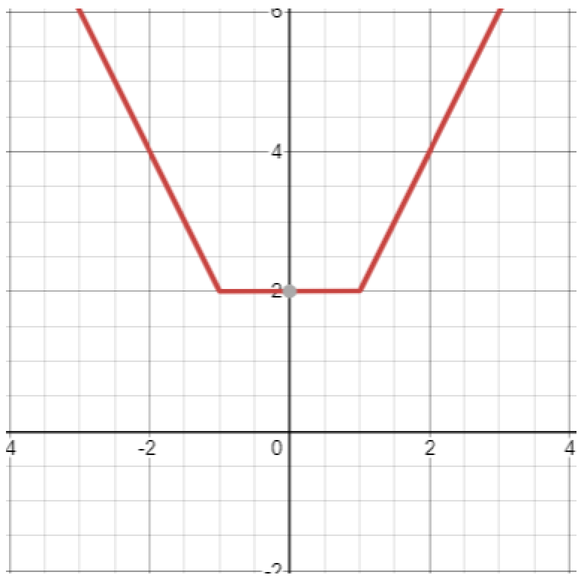
The given point (1/2, 1) is in the first quadrant.

Now, the given equation y = |x - 1| + |x + 1|

We can rewrite the given equation in the following cases:

Case	|x -1|	|x+1|	y
X<-1	1 − x	-x-1	-2x
X = -1	2	0	2
-1<x<1	1-x	X+1	2
X=1	0	2	2
1<x	x-1	X+1	2x

So, the graph will be:



Now, (1/2, 1) is closest to the horizontal part of the above graph.

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As the horizontal part represents y = 2, the distance from (1/2, 1) will be 2 - 1 = 1.

Hence, option (A) is the correct answer.

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

31. If the square of the 7^{th} term of an arithmetic progression with positive common difference equals the product of the 3^{rd} and 17^{th} terms, then the ratio of the first term to the common difference is:

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

Answer: A

Solution:

Let the first term be a and the common difference be d.

So, 3^{rd} term = a + 2d, 7^{th} term = a + 6d and 17^{th} term = a + 16d

According to the question, $(a + 6d)^2 = (a + 2d)(a + 16d)$

$a^2 + 36d^2 + 12ad = a^2 + 2ad + 16ad + 32d^2$
2d = 3a
2/3 = a/d
a:d = 2:3
Hence, option (A) is the correct answer.

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

32. In how many ways can 7 identical erasers be distributed among 4 kids in such a way that each kid gets at least one eraser, but nobody gets more than 3 erasers?

A. 16
B. 20
C. 14
D. 15

Answer: A

Solution:

The possible arrangements are:

1, 1, 2, 3 and number of arrangements = $\frac{4!}{2!} = 12$

1, 2, 2, 2 and number of arrangements = $\frac{4!}{3!} = 4$

Total = 16

Hence, option (A) is the correct answer.

###TOPIC###Quantitative Aptitude||Higher Maths||Permutation and Combination###

33. If f(x) = $(5x + 2)/(3x - 5)$ and g(x) = $x^2 - 2x - 1$, then the value of g(f(f(3))) is:

A. 2.
B. 1/3.
C. 6.
D. 2/3.

Answer: A

Solution:

g(f(f(3))) = g(f(17/4)) = g(3) = $3^2 - 2x3 - 1$ = 9 - 6– 1= 2.

Hence, option (A) is the correct answer.

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

34. Let a_1, a_2,.......a_{3n} be an arithmetic progression with a_1 = 3 and a_2 = 7. If $a_1 + a_2 + ...+a_{3n}$ = 1830, then what is the smallest positive integer m such that m ($a_1 + a_2 + ... + a_n$) > 1830?

A. 8
B. 9
C. 10
D. 11

Answer: B

Solution:

The given AP has first term = 3 and second term = 7

So, the common difference = 4

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So, sum up to $3n^{th}$ term = $\frac{3n}{2}(2\times3 + (3n - 1)\times4) = 3n(3 + 6n - 2) = 3n(6n + 1)$

So, $3n(6n + 1) = 1830$

Or $n(6n + 1) = 610$

Or $6n^2 + n - 610 = 0$ or $n = 10$

Now, sum up to 10^{th} term = $\frac{10}{2}(2\times3 + 9\times4) = 5(6 + 36) = 210$

So, $210m > 1830$

So, $m > 8.7$

So, minimum value of $m = 9$

Hence, option (B) is the correct answer.

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

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