

Cognizant Placement Paper

1. There are forty students in a class out of which there are 14 who are taking Maths and 29 who are taking Computer. What is the probability that a randomly chosen student from this group is taking only the Computer class?

- a) 40%
- b) 55%
- c) 65%
- d) 70%

Answer: 65%

Solution:

There are in total of 40 students. 14 are taking Maths and 29 are taking computer. Therefore there have to be 3 students who are taking both the classes. So, $29 - 3 = 26$ students are taking only Computer. So probability = $26/40 = 13/20 = 65\%$

2. Find the number, the second digit of which is smaller than its first digit by 4, and if the number was divided by the digit's sum, the quotient would be 7.

- a) 51
- b) 62
- c) 73
- d) None of these

Answer: d) None of these

Solution: *If we consider the number 84, then we get $8 - 4 = 4$ and when the sum of digits that is 12 divides the number 84, we get 7.*

3. If all 6s get inverted and become 9s, between 1 and 100 then by how much will the sum of all numbers change including both?

- a) 300
- b) 330
- c) 333
- d) None of these

Answer: b) 330

Solution:

For the 6 at the unit place:

*When the digits are changed to 9, each value will increase by 3. Since there are 10 such numbers, so total increase = $10 * 3 = 30$*

For the 6 at 10's place:

When the digits are changed to 9, each value will increase by 30. Since

there are 10 such numbers, so total increase = $10 * 30 = 300$

So the total increase will be $30 + 300 = 330$

4. Rajesh and Prabhu went to a bookshop. Rajesh purchased 5 pens, 3 notebooks, and 9 pencils and used up all her money. Prabhu purchased 6 pens, 6 notebooks, and 18 pencils and paid 50% more than what Rajesh paid. What % of the Rajesh money was spent on pens?

- a) 12.5
- b) 62.5
- c) 75
- d) Cannot be determined

Answer: a) 62.5

Solution:

Let the amount spent by Rajesh be 'x'

According to the question,

$$5 \text{ pen} + 3 \text{ notebooks} + 9 \text{ pencils} = x$$

and

$$6 \text{ pens} + 6 \text{ notebooks} + 18 \text{ pencils} = 1.5x$$

By solving both the equations we get,

$$1 \text{ pen} = 0.125x$$

$$\Rightarrow 5 \text{ pens} = 5 * (0.125x) = 0.625x = 62.5\% \text{ of } x.$$

5. In a group of persons travelling in a bus, 6 persons can speak Tamil, 15 can speak Hindi, and 6 can speak Gujarati. In that group, none can speak any other language. If 2 persons in the group can speak two languages and one person can speak all three languages, then how many persons are there in the group?

- a) 21
- b) 22
- c) 24
- d) 23

Answer: d) 23

Solution:

Assuming the two persons who can speak two languages be Hindi and Tamil and the third person speaks all the three languages.

$$\text{Therefore, the number of people who can speak Tamil is 6. Only Tamil} = 6 - 2 - 1 = 3$$

$$\text{Therefore, the number of people who can speak Hindi is 15. Only Hindi} = 15 - 2 - 1 = 12$$

Therefore, the number of people who can speak Gujarati is 6. Only Gujarati
 $= 6 - 1 = 5$

Thus the number of persons who can speak only one language is $3 + 12 + 5$
 $= 20$

Given,

The number of persons who can speak two languages is 2

The number of people who speak all three languages is 1

Therefore the answer is 23.

6. There are 2 trucks facing each other at a distance of 500 cm from each other. Each truck moves forward by 100 cm at a speed of 50 cm/s and then moves backwards by 50 cm at a speed of 25 cm/s. How long will they take to collide?

- a) 12 sec
- b) 16 sec
- c) 13 sec
- d) 14 sec

Answer: d) 14 sec

Solution:

If we observe the series carefully running from time = 2 sec and hence,

Moving forward:

At 2 secs each truck will move to a distance of 100cms

Moving backwards:

At 4 secs each truck will move to a distance of 50cms

Moving forward:

At 6 secs each truck will move to a distance of 150cms

Moving backwards:

At 8 secs each truck will move to a distance of 100cms

Moving forward:

At 10 secs each truck will move to a distance of 200cms

Moving backwards:

At 12 secs each truck will move to a distance of 150cms

Moving forward:

At 14 secs each truck will move to a distance of 250cms and in all 500 cms that are the point they must collide.

7. What is the greatest number that will divide 964, 1238, and 1400 and leave a remainder of 41, 31, and 51 respectively?

- a) 71
- b) 58
- c) 64
- d) 79

Answer: a) 71

Solution:

To reach to the solution we just need to find the HCF of $(964 - 41)$, $(1238 - 31)$, $(1400 - 51) = 923, 1207, 1349$

The HCF of 923, 1207 and 1349 = 71

8. The average temperature of Monday, Tuesday and Wednesday were 37°C and on Tuesday, Wednesday and Thursday was 34°C . If the temperature on Thursday was $\frac{4}{5}$ th of that of Monday, then what was the temperature on Thursday?

- a) 36°C
- b) 36.5°C
- c) 34°C
- d) 35.5°C

Answer: a) 36°C

Solution:

According to the question,

Monday + Tuesday + Wednesday = 37°C

Tuesday + Wednesday + Thursday = 34°C

Thursday = $\frac{4}{5}$ of Monday

On solving the first two equations and substituting the values from the third condition we get the temperature of Thursday = 36°C

9. There are 6 cities, and every city is connected to each other. How many different routes can one trace from A to B, such that no city is touched more than once in any one route?

- a) 72
- b) 65
- c) 60
- d) 48

Answer: b) 65

Solution:

There must be 1 direct route.

There are 4 ways to cover 1 city

*There are $4 * 3 = 12$ ways to cover 2 cities*

*There are $4 * 3 * 2$ ways to cover 3 cities*

*There are $4 * 3 * 2 * 1$ ways to cover 4 cities*

Total ways = 65 ways

10. A secret can be said by only 2 persons in 5 minutes. The same person tells the secret to 2 more persons and so on. How long will take to tell it to tell 768 persons?

- a) 500 min
- b) 50 min
- c) 47.5 min
- d) 49 min

Answer: c) 47.5 min

Solution:

One person telling to 2 means he takes 2.5 min to tell the secret to 1 person,

So 1 person telling the truth to another 2 people and the next two telling the truth to the next two who in turn are telling another 2 people and so on...

Therefore a series is formed of 1 to 2, 2 to 4, 4 to 8, 8 to 16 and so on...

Therefore a series of 1, 2, 4, 8, 16, 32,..., 512

Till 512 it would take

Till this will take 45 minutes and now these people i.e., 256 will be telling the truth to only 1 of the total person will be 768,

Therefore, $45 + 2.5 = 47.5$ min

1) Three cubes of edges 6 cms, 8 cms, and 10 cms are melted without loss of metal into a single cube. The edge of the new cube will be:

- a) 16 cm
- b) 14 cm
- c) 12 cm
- d) 8 cm

Answer: c) 12 cm

Solution:

Since the cube is melted so the volume of the new cube must be the same.

Volume of new cube = Volume of cube 1 + cube 2 + cube 3 = $6^3 + 8^3 + 10^3$

= $216 + 512 + 1000$

$a^3 = 1728,$

$a = (1728)^{(1/3)} = 12$

2) A reduction in the price of mangoes by 20% enables a farmer to purchase 12 more mangoes for Rs. 15. So what could be the price of 16 mangoes

before the reduction of the price?

- a) Rs. 9
- b) Rs. 7
- c) Rs. 5
- d) Rs. 6

Answer: c) Rs. 5

Solution:

We know that

$Price * Consumption = Expenditure$

and, $Consumption = Expenditure Price$

So,

$$(15 / 8x) - (15 / x) = 12$$

$$x = (15 * 2) / (12 * 8)$$

$$\text{For 16 Mangoes} = [(15 * 2) / (12 * 8)] * 16 = 5 \text{ (answer)}$$

3) Aman completes a journey in 10 hours. He travels the first half of the journey at the rate of 21 km/hr and the second half at the rate of 24 km/hr. Find the total journey in km.

- a) 220 km
- b) 234 km
- c) 230 km
- d) 224 km

Answer: d) 224 km

Solution:

According to the question,

$$((1/2)x)/21 + ((1/2)x)/24 = 10$$

$$\text{Solving this equation we get } 15x = 168 * 20$$

$$\text{Further } x = (168 * 20)/15 = 224 \text{ km.}$$

4) There are two alarm clocks ringing at regular intervals of 50 seconds and 48 seconds. If they first beep together at 12 noon, at what time will they beep again together?

- a) 12:10 PM
- b) 12:20 PM
- c) 12:11 PM
- d) 12:12 PM

Answer: b) 12:20 PM

Solution:

This can be found by finding the LCM of 48 and 50.

They will ring together after,

LCM of 48 and 50 secs.

$$48 = 2 \times 2 \times 2 \times 2 \times 3;$$

$$50 = 2 \times 5 \times 5;$$

$$\text{So, LCM} = 2 \times 2 \times 2 \times 2 \times 3 \times 5 \times 5 = 1200 \text{ secs} = 20 \text{ min.}$$

Therefore, they will beep together at 12:20 PM next.

5) Ram purchased 20 dozen toys at the rate of Rs. 375 per dozen. He sold each one of them at the rate of Rs. 33. What was his percentage profit?

- a) 5.6 %
- b) 4.5 %
- c) 3.5 %
- d) 6.5 %

Answer: a) 5.6 %

Solution:

Let's find the cost price of 1 toy = $375 / 12 = 31.25$ rupees.

Now, SP of 1 toy = 33 rupees.

$$\text{So, Gain} = \text{SP} - \text{CP} = (33 - 31.25) = \text{Rs. } 1.75$$

$$\text{and Profit \%} = 1.75 / 31.25 * 100 = 5.6 \%$$

6) A cistern can be filled by a tap in 4 hours while it can be emptied by another tap in 9 hours. If both the taps are opened simultaneously, then after how much time cistern will get filled?

- a) 7 hours
- b) 7.1 hours
- c) 7.2 hours
- d) 7.3 hours

Answer: 7.2 hours

Solution:

So according to the question,

$1/4$ th of the cistern can be filled in one hour

$1/9$ th of the cistern can be emptied in 1 hour

$$\text{Therefore, net filled in 1 hour} = 1/4 - 1/9 = 5/36$$

$$\text{So cistern that can be filled in } 36/5 \text{ hours} = 7.2 \text{ hours}$$

7) In how many different ways, can the letters of the word 'INHALE' be arranged?

- a) 650 ways
- b) 360 ways
- c) 120 ways
- d) 720 ways

Answer: d) 720 ways

Solution:

There are 6 letters in the word and no letters are repeated.

So, the 6 letters can be arranged in $6!$ ways = 720 ways.

8) In a meeting, there are 12 people. All the persons of one country shake hands with all delegates of the other country. Find the number of handshakes possible?

- a) 66
- b) 288
- c) 144
- d) 234

Answer: a) 66

Solution:

*Total number of handshakes = $n(n-1)/2 = (12 * 11)/2 = 66$*

9) What is the smallest number that when decreased by 8 is divisible by 21, 27, 33, and 55?

- a) 1490
- b) 10405
- c) 15490
- d) none of the above

Answer: d) none of the above

Solution:

We need to find the LCM of the given numbers,

LCM of 21, 27, 33, and 55 = 10395

So we need to add an extra 8 = 10403 (answer)

10) There are 8 football teams in a certain league and each team plays each of the other teams exactly once. If each game is played by 2 teams, what is the total number of games played?

- a) 15
- b) 16
- c) 64
- d) 28

Answer: d) 28

Solution:

Since there are 8 teams, so each pair will play a match = $8C2 = 28$ matches.

A train running at 5 km/hr and 125 meters long passes a man moving in the same direction in which the train is going, in 10 seconds. The speed of the train is:

- a) 50 km/hr
- b) 54 km/hr
- c) 55 km/hr
- d) 60 km/hr

Answer: a) 50 km/hr

Solution:

*The relative speed of the train to man = $(125 / 10) \text{ m/s}$
= $25 / 2 \text{ m/s}$
= $(25/2 * 18/5) \text{ km/hr}$
= 45 km/hr*

Let the relative speed of the train be $x \text{ km/hr}$.

Therefore, $x - 45 = 5$ or $x = 50 \text{ km/hr}$

- 1.
2. A sum fetched a total simple interest of Rs. 4016.25 at the rate of 9 % p.a. in 5 years. What is the sum of the money or the principal amount?

- a) Rs. 4462.50
- b) Rs. 8032.50
- c) Rs. 8900
- d) Rs. 8925

Answer: d) Rs. 8925

Solution:

We know, $SI = PTR/100$

*or, $P = (SI * 100) / TR$*

*or, $P = (4016.25 * 100) / 9 * 5$*

or, $P = 8925 \text{ (answer)}$

3. In an election between two candidates, one got 55% of the total valid votes and got 20% invalid votes. At the end of the day when the total number of votes were counted, the total number was found to be 7500. So what was the total number of valid votes that the winning candidate got, was:

- a) 2800
- b) 3300
- c) 3100
- d) 2700

1. Answer: d) 2700

Solution:

*Since 20% of the votes were invalid, 80% of the votes were valid =
80% of 7500 = 6000 votes were valid*

*Since one candidate got 55% of the total valid votes, then the second candidate must have 45% of the votes = $0.45 * 6000 = 2700$ votes*

2. January 1, 2008, is Tuesday. What day would lie on Jan 1, 2009?
- a) Thursday
 - b) Sunday
 - c) Tuesday
 - d) Wednesday

Answer: a) Thursday

Solution:

In such type of questions, one needs to identify the type of year, i.e., whether the year is a normal year or is it a leap year.

So the year 2008 was a leap year. So, it has to have 2 odd days.

The year following 2008 is 2009 so the first day of the year would be two days ahead of what it was in 2008. So 1st Jan 2009 would be a Thursday.

3. A whole number n which when divided by 4 gives 3 as remainder. What will be the remainder when $2n$ is divided by 4?
- a) 0
 - b) 1
 - c) 2
 - d) 4

Answer: c) 2

Solution:

According to the question,

$$n = 4q + 3$$

therefore, $2n = 8q + 6$

or, $2n = 4(2q + 1) + 2$

Thus, we get when $2n$ is divided by 4, the remainder is 2.

4. In a 100 m race, Aman takes 36 seconds to complete the race and Bijay takes 45 seconds. By what distance Aman beats Bijay in the race?
- a) 20 meters
 - b) 25 meters
 - c) 22.5 meters
 - d) 9 meters

Answer: b) 20 meters

Solution:

The difference in the time of the race completion = $45 - 36 = 9$ sec.

*So the distance covered by Bijay in 9 sec = $100/45 * 9 = 20$ meters.
Therefore Aman beats Bijay by 20 meters*

5. Identify the odd number from the series: 835, 734, 642, 751, 853, 981, 532
- a) 532
 - b) 853
 - c) 981
 - d) 751

Answer: d) 751

Solution:

Looking at the series closely we see that in each number, the difference between the first and last digit of each number is the middle number, except 751

6. In a group of 6 men and 4 women, four are to be selected. In how many different ways can they be selected such that at least one man should be there in the group?
- a) 209 ways
 - b) 194 ways
 - c) 205 ways
 - d) 120 ways

Answer: a) 209 ways

Solution:

A group of 4 has to be selected with at least one man So this can be done in

(1 man and 3 women), (2 men and 2 women), (3 men and 1 women) and 4 men.

The number of ways in which this can be done is

$(6C1 \times 4C3) + (6C2 \times 4C2) + (6C3 \times 4C1) + (6C4)$

On solving this we get 209 ways in which these combinations can be obtained.

7. A box contains 15 marbles out of which 4 are white, 5 are red and 6 are blue. Three balls are to be drawn at random from the bag. What is the probability that all of them are red is:
- a) $1/22$
 - b) $2/89$
 - c) $2/77$
 - d) $2/91$

Answer: d) $2/91$

Solution:

The number of ways in which all the three balls would be red =
 $5C3 / 15C3$
 $= 10/455 = 2/91$

8. X, Y and Z can do a piece of work in 20, 30 and 60 days respectively depending on their capacity of doing work. If X is assisted by Y and Z on every third day, then in how X will complete the work?
- a) 12 days
 - b) 15 days
 - c) 16 days
 - d) 18 days

Answer: b) 15 days

Solution:

We need to first count the amount of work done in 2 days by X

X can do a piece of work in 20 days

So, in 2 days he can do $= 1/20 * 2 = 1/10$

Amount of work done by X, Y and Z in 1 day $= 1/20 + 1/30 + 1/60$
 $= 1/10$

So, amount of work done in 3 days $= 1/10 + 1/10 = 1/5$

So the work will be completed in $3 * 5 = 15$ days.

1. Two numbers are in the ratio of 5:7. If their LCM is 105, what is the difference between their squares ?
- a. 216
 - b. 210
 - c. 72
 - d. 840

Answer:

216

Explanation:

Let 'h' be the HCF of the two numbers.

\Rightarrow The numbers are 5h and 7h.

We know that Product of Numbers = LCM x HCF

$\Rightarrow 5h \times 7h = 105 \times h$

$\Rightarrow h = 3$

So, the numbers are 15 and 21.

Therefore, difference of their squares $= 21^2 - 15^2 = 441 - 225 = 216$

2. Three people A, B and C working individually can finish a job in 10, 12 and 20 days respectively. They decided to work together but after 2 days, A left the work and after another one day, B also left work. If they got two lacs collectively for the entire work, find the difference of the highest and lowest share.
- 70000
 - 60000
 - 10000
 - 20000

Answer:

70000

Explanation:

Let the total work be $LCM(10, 12, 20) = 60$ units

=> Efficiency of A = $60/10 = 6$ units / day

=> Efficiency of B = $60/12 = 5$ units / day

=> Efficiency of C = $60/20 = 3$ units / day

Since the number of working days are different for each person, the share of each will be calculated in the ratio of the units of work done.

Now, A works for 2 days and B works for 3 days.

=> Work done by A = $2 \times 6 = 12$ units

=> Work done by B = $3 \times 5 = 15$ units

=> Work done by C = $60 - 12 - 15 = 33$ units

Therefore, ratio of work done = $12:15:33 = 4:5:11$

So, A's share = $(4/20) \times 2,00,000 = \text{Rs } 40,000$

B's share = $(5/20) \times 2,00,000 = \text{Rs } 50,000$

C's share = $(11/20) \times 2,00,000 = \text{Rs } 1,10,000$

Therefore, difference of the highest and lowest share = $\text{Rs } 1,10,000 - 40,000 = \text{Rs } 70,000$