SOLUTION

Que:31

Using statement 1 alone, taking a= 2, b=1 satisfies and gives $a>b$. Similarly taking a=-2 and b=1 satisfies and $a<b$. Hence, nothing can't be concluded.

Using statement 2 alone, $a>b$. Hence unique answer can be obtained that "No" b is not greater than a.

Que:32

Using statement 1 alone, nothing can be said about individual values of a, b, c and d.

Using statement 2 alone, a, b, and c are less than 24 but nothing can be said about value of d.

Combining both, we can say that d is more than average 25 and others are less than 24.

Hence, d is the largest.

Que:33

Using statement 1 alone, since it is not given that what are the maximum marks for each of the papers, hence just by knowing that 300 marks obtained by Rez does not provide us with any other information.

Using Statement 2 alone, let us assume that marks obtained are 4x, 5x, 6x, 7x and 8x. Now 4x=30%. Hence, we can now find out that in how many papers Rez has scored more than 50% of marks.

Que:34

Using statement 1 alone will not answer the question.

Using statement 2 alone tells that one side of the triangle is the diameter of the circle and hence will be the hypotenuse of the circle. Hence, the triangle is right angled triangle.

Que:35

Using statement 1 alone, we can say that B and D are females. No information for the rest of the members.

Using statement 2 alone, we can say that A and C are males but nothing can be said about the other members.

Even after combining both, exact numbers of males can't be determined.

Que:36

Using statement 1 alone, the point of accident is not cleared.

Using statement 2 alone, nothing can be said about the speed of the bus. Even after combining the two statements, the speed of bus can't be determined as the total distance between A and B is not given.	
Que:37	
Using statement 1 and 2 alone, nothing can be concluded. Combining both, let the number of boys be x and girls be 3x. Then X+ 100/ 3x+150 will be new ratio but value of X is unknown. Hence the new ratio cannot be determined.	
Que:38	
Using statement 1, we cannot determine if $(x^4 – y^4)$ is greater than 0 or less than 0 since we don't have the sign of $(x^3 + y^3)$. Hence we cannot determine anything. Using statement 2, we cannot determine if $(x^3 - y^3) >$ **0 since** $(x^4 + y^4) >0$. $(x^3 - y^3) > 0$, So x>y.	
Que:39	
Using statement 1, at least one of a or b will be divisible by 11, but we are not sure that which of a or b will be divisible by 11. Using statement 2, b is divisible by 2 but it does not give that which of a or b is divisible by 11. Using both the statements together, we cannot find if a is divisible by 11 or not	
Que:40	
Using statement 1 and 2 alone, nothing can be concluded about the respective position of C and D. Combining both, unique answer can be obtained.	
Que:41	
Going by options, For any x>= 1, we have $2 <= (1 + 1/x)^x < 2.8$ $51^{49}/ 50^{50} = [51^{50}/ 50^{50}]* 1/51 = [50+1/50]^{50}*1/51$ Hence $51^{49} > 50^{50}$ is not true. By using same logic, we can say that option B is true.	
Que:42	
Given 3x + 4y = 20 Consider $[3\frac{x}{3}]^3 * [4 \frac{y}{2}]^2$	

Sum of factor = $3\frac{x}{3} + 3\frac{x}{3} + 3\frac{x}{3} + 4\frac{y}{2} + 4\frac{y}{2} = 3x + 4y = 20$

If the sum of the factors is constant then their product is maximum when the factors are equal i.e,

$3\frac{x}{3} = 4\frac{y}{2}$

$\frac{3x + 4y}{5} = x = 2y = 20/5$

x =4 and y = 2. Hence, putting value in the required expression, answer will be 256.

Que:43

Suppose Shania sells U umbrella, R raincoats and C caps then

100U + 120R+ 25C= 560 ---- (1)

Dividing this by the least coefficient 25, and separating fractions and integers, we get 20R/25 – 10/25 = K, where K is an integer.

R= 25K + 10/20

K=2, R=3

Now, 100U + 25C = 200 with $200 on umbrellas and caps, she could sell exactly 1 umbrella and 4 caps. Hence total number of items that she sold are 3 rain coats + 4 caps = 8 items.

Que:44

The average weight of a certain group of ‘n’ men being 75Kg, the total weight of the group is 75n. Let x be the weight of the man who left the group.

We have 90 < x < 100

Now $\frac{75n+(80+76+74)-x}{n+3-1} = 73$

75n + 230 – x = 73n + 146

i.e., 2n + 84 = x

As 90 < x < 100, we have 90< 2n + 84 < 100

3 < n < 8. As n is a perfect square, it has to be 4. Hence x= 92 Kg.

Que:45

Let the day on which Kingston was born be D and month be M. Then we have 12D+31M= 376. Divide the equation by the least coefficient 12, and collect all fractions on left and all integers on the right. Now denoting the combination of all integers on right by ‘k’, we get,

7M/12 – 4/12 = k

M = (12k + 4)/7

By trial and error, we get k=2 which gives M=4. Now next possible value of k=7 gives M=16. Since M is month it has be M=4. Using this in 12D+31M=376, we get D = 21. Hence Kingston was born on 21st April.	
Que:46	
Given the sum of cubes of first p natural numbers = 1296 $= \frac{p2\ (p+1)2}{4}$ = 1296, solving for p, we get p=8 Arithmetic mean = 1296/8 = 162.	
Que:47	
Let the diagonals of a rhombus be d_1 and d_2 $(d_1 + d_2)^2 - (d_1 - d_2)^2 = 4800 = d_1 d_2 = 1200$ Area = ½* $d_1 d_2$ = 600 cm^2.	
Que:48	
$\frac{a^\wedge 2(b+c)+ b^\wedge 2(c+a)+c^\wedge 2(a+b)}{abc}$ = k, k = $\frac{a2b+a2c+b2c+b2a+c2a+c2b}{abc}$ >= 6 ($a^6b^6c^6)^{1/6}$ (A.M>= G.M) k>= 6abc/abc i.e., k>=6.	
Que:49	
The purse contains 50 paisa and one-rupee coins in the ratio 1:2. If some coins are selected at random from the box, the expected value of the ratio of the 50 paisa coins and the 1 rupee coins is 1:2. Hence, if a coin is picked from the selection the probability of getting a one-rupee coin is 2/3.	
Que:50	
Let the numbers of tables and chairs purchased be x and y respectively. $6x + \frac{3}{4}y = 126$ ⇨ 2x + y/4 = 42 or 8x + y = 168 – **(1)** Had she interchanged the numbers of tables and chairs, the total cost is $6y + \frac{3}{4}x \leq 63$ => $8y + x \leq 84$ --- **(2)** Eliminating y from (2) by using (1), we have $8(168-8x) + x \leq 84$ => $1344 – 64x + x \leq 84$.	

Solving further we get x=20 and y=8. Hence answer is 20+8=28.	
Que:51	
The number of trials is Maximum. If the last digit of password is 9. Let the last digit be 9. If the first digit is 9 then the second digit can be only 0. If the first digit is 8 then the second digit can be 0 or 1. Similarly, the number of possibilities for the second digit can be worked out for the other values of the first digit which are 0 or 7. The total number of possibilities we get = sum of number of possibilities for the second digit for each possible value of the first digit = 1 + 2 + 3 +…+10 = 55.	
Que:52	
As per the description of the game, the winner is selected purely by chance and no person has an advantage over any other person. i.e., each person has an equal probability of winning. Hence the probability of A winning = 1/5	
Que:53	
$7^{4034} = (7^4)^{1008} * 7^2$ $(7^4)^2$ = (2401) (2401) whose last two digits are that of (01) (01) or (01). $(7^4)^3 = (7^4)^2(7^4)$ whose last two digits are that of (01) (01) or (01). Hence, $(7^4)^N$ where N is any natural number must end with 01. $(7^4)^N * 49$ ends with 49.	
Que:54	
Number is divisible by 5, 8 => by 40 Number is should end with 0 ⇨ C=0, B60 is divisible by 8 ⇨ B = 1, 3, 5, 7, 9, B ≠ prime => B = 1 or 9. Adding all the digits 27 + A + B + C is divisible by 9 ⇨ A + B + C is divisible by 9 ⇨ A + B is divisible by 9 as C=0 ⇨ A + B = 9 or 18 because A and B are digits. But A+B = 18 as A≠B. Hence A + B=9.	
Que:55	
When 4831, 4833 and 4835 are divided by 24; the remainders are 7, 9, and 11 respectively. N = (4831) (4833) (4835) and (7) (9) (11)= 693 have the same remainder.	

And when 693 is divided by 24, the remainder is 21.	
Que:56	
The n^{th} term of an arithmetic progression with the first term a and common difference d is given by a + $(n-1)^d$. For the given series, a= 6 and d=7. Its n^{th} term => 6 + $(n-1)^7$ = 636 => n = 91.	
Que:57	
Let the three numbers be a-d, a and a+d a-d+d+a-d=36 => a= 12. $(12-d)^2 + 12^2 + (12 + d)^2 = 464$ $d^2 = 16$ d= ±4 If d is either + 4 or – 4, the numbers are 8, 12, and 16. The smallest is 8.	
Que:58	
Let the car is rented for 8 hours or less. Then the number of hours it is rented for 800/100 = 8 hours. But if charged $10 per km, the amount that should be paid 120 (8) = 960. But the company paid only $800. The car is rented for more than 8 hours. Number of hours = 800/80 = 10 hours.	
Que:59	
As f(x) has terms of only even degree, f(-x) is identical to f(x). The number of sign changes in f(x) is 3. The number of positive roots is 3 or 1. Similarly, the number of negative roots is 3 or 1. Also there are 4 non-real roots. This accounts for 1 +1+4 or 1 + 3+ 4 or 3+1+4 or 3+3+4. i.e., 6 or 8 or 10 roots. The remaining roots have to be 0. i.e., The multiplicity of the root 0 is at least 2 i.e., $a_0 = 0$.	
Que:60	
They are going to meet again at the starting point after LCM of (20 minutes 24 seconds, 45 minutes 20 seconds and 40 minutes 48 seconds). $=\frac{LCM\ of\ (102,136,204)}{HCF\ of\ (5,3,5)}$ = 408minutes = 6 hours 48 minutes.	
Que:61	

Given the sum of the ages of Clark and Bret = 80 years. Let Bret's age be a years and Clark's age be b years. Clark was as old as Bret is exactly b-a years ago. At that time, Bret's age was = a-(b-a) = 2a-b. Given b=3(2a-b) ⇨ 4b=6a ⇨ b : a = 3 : 2 But given a + b = 80 ⇨ a=32 ⇨ b=48 k years ago, let Clarke be twice as old as Bret. ⇨ (32-k)2= 48-k ⇨ K=16
Que:62
Given p= √5 – 2 => p + 2 = √5 ⇨ $P^2 + 4p + 4 = 5$ ⇨ $P^2 + 4p = 1$ ⇨ $P^4 + 16p^2 + 8p^3 = 1$ ⇨ $P^4 + 8p^3 + 16p^2 + 4 = 5$
Que:63
By observation, the minimum percentage decrease in sales volume of desktops could occur in any of August, October or November. It is a maximum of 60% i.e., (500 - 200)/500 * 100 in November.
Que:64
By observation, the required ratio is highest in November and equals 700/200 = 3.5.
Que:65
By observation, the required percentage increase of at least 30% was seen in the months of May, August and January i.e., three months.
Que:66
Let the total number of students in the class be 't'. If everyone exchanged 'a' band with ever other student, then t(t-1) bands are needed => t(t-1) = n But since two students did not turn up (t-2)(t-3) bands would have been unused

⇨ t(t-1) – (t-2)(t-3) = 50 (given) ⇨ t^2 – 1- t^2 + 5t + 6 = 50 ⇨ 4t = 56 => t=14 If one student did not turn up. 14*13 – 13*12 =26 bands remain unused.	
Que:67	
= - [4(1+3+5+7] + [5(2+4+6+8)] = - 4(4.4) + 5 (5.4) = 4[5^2- 4^2] = 4(4) +4(5) Similarly every two terms will result in two such simplified term. Hence S=4(4 + 5 + ...+ 82 terms) =4(4+5+...+85) =4[(1 +2 + 3 + ...+ 85) – (1 + 2 +3)] =4 [85* 86/2 – 6] = 14596.	
Que:68	
P + Q + R + S + T = 482. Sum of five prime numbers is even possible only if four of these are odd and one is even (all these cannot be odd). So, P=2, hence answer will be 2^5 = 32.	
Que:69	
If Sam would have increased his speed by 25% in the beginning, he would have saved one hour in covering the actual planned distance. So, 1/5 T = 1 hr (Where T is the actual planned time). Hence, T = 5 hours.	
Que:70	
Saving in time would be in the later 4 hours part. Since speed is increase by 25%, time taken to cover the same distance would reduce by 20%. Hence, he would save 48 minutes. Hence total time taken will be 4 hours and 12 minutes.	