SOLUTION	
Que:71	

Given that DE and FG are both parallel to B.

⇨ DE is parallel to FG.

$\therefore \Delta ADE \sim \Delta AGF$

Since the area of Δ ADE is equal to the area of the quadrilateral DEGF, the area of Δ AFG is twice the area of the Δ ADE.

$$\frac{Area\ of\ \Delta\, ADE}{Area\ of\ \Delta\, AFG} = \left(\frac{AD}{AF}\right)^2 = \left(\frac{AE}{AG}\right)^2 = \left(\frac{DE}{FG}\right)^2$$

$$\therefore \left(\frac{DE}{FG}\right)^2 = \frac{1}{2}$$

$$\Rightarrow \quad \frac{DE}{FG} = \frac{1}{\sqrt{2}}$$

Que:72	

Given equation 31x + 13y = 75.

(A) (2, 1) satisfies the given equation 31(2) + 13(1) =75.

Any pair (x, y) satisfying the equation can be expressed in the form (2-13K, 31K+1) where k is an integer.

∴ When K=1 (2 – 13(1), 31+1) = (-11,32)

When K=2 (2 – 13(2), 31+2) = (-24,63)

K=3 (2 – 13(3), 31+3) = (-37,94)

∴ Option (D) does not satisfy the given equation.

Que:73	

It is sufficient to compare the ratio $\frac{20.7}{32.8}$ (i.e., mango) with the ratio $\frac{27.4}{6.9}$, $\frac{19.4}{11.8}$, $\frac{5.8}{14.3}$, $\frac{4.6}{6.1}$, $\frac{18.7}{24.7}$ and $\frac{3.4}{3.4}$

By observation, only $\frac{5.8}{14.3}$ (i.e., Apples) is less than $\frac{20.7}{32.8}$. Hence only one variety of fruit.

Que:74	

Export price per tonne for walnuts is proportional $\frac{27.4}{6.9}$ which is the highest ratio.

Statement A is true as Walnuts has the highest ratio of value to quality.

Statement B is true as $\frac{20.7}{32.8} < \frac{18.7}{24.7}$.

Statement C is true as $\frac{3.4\%\ of\ x}{3.4\%\ of\ y} = \frac{x}{y}$.

Statement D is true as $\frac{19.4\%}{11.8\%} < 2\ \left(\frac{3.4}{3.4}\right)$.

Que:75

Let the total production of all the fresh fruits be 100.

⇨ Exports of fresh fruits = 30

From the 1st pie-chart, exports of mango = 32.8% of exports of all fresh fruits = 32.8% of 30 which is 20% of the production of mangoes.

∴ 32.8% of 30 = 20% P_M => $P_M = \frac{32.8*30}{20} = 49.2$

Out of the total production of 100, share of mangoes = 49.2 or 49.2%.

Que:76

If the money is equal in dollars terms, then it will be so even in rupee terms. A Robert got 24 + 8 =32 rupees and now all of three have equal amount.

Total amount = 32*3 = 96 rupees

Total amount = (12D+5E) + (8D+4E) = 20D+9E

∴ 20D+9E=96

Also after giving 8 rupees to Robert, Nelson is left with 32 rupees.

⇨ 8D + 4E -8 =32

⇨ 2D + E = 10 → (2)

(2) * 10 – (1) gives E =4.

Que:77

Let Nelcy and Mike together can complete the work in n days.

⇨ Nelcy takes (n+12) days

⇨ Mike takes (n+27) days

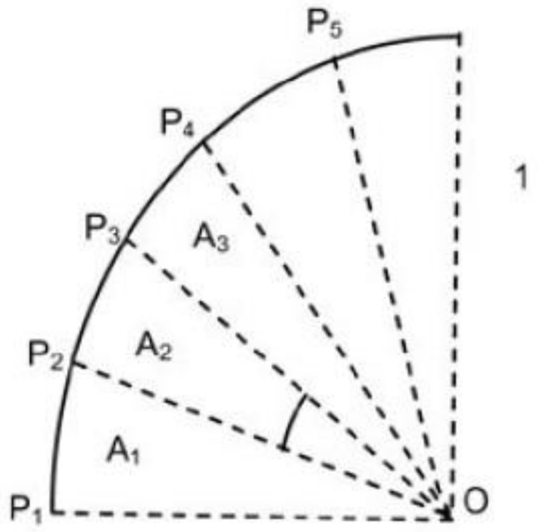
∴ $\frac{1}{(n+12)} + \frac{1}{(n+27)} = \frac{1}{n}$

⇨ n[(n+12) + (n+27)] = (n+12)(n+27)

⇨ $2n^2 + 39n = n^2 + 39n + (27)(12)$

⇨ $n^2 = (27)(12) = 324$

⇨ n = 18

But Nelcy and Mike worked for only 15 days. ⇨ They completed $\frac{15}{18} = \frac{5}{6}$ th of the work. ⇨ James completed $\frac{1}{6}$ th of the work. ∴ James share = $\frac{1}{6}$(3000) = Rs. 500	
Que:78	
Observe that $(-1)^{2i} = 1$, for all values of i. Hence $OP_1 = OP_2 = OP_3 \ldots = OP_n = 1$ unit. Consider the section of polygon as shown.	
	As we choose large value of 'n' we make the figure close to a circle of radius 1 unit. Hence for large values of 'n', the area of polygon will be closed to $\pi(1)^2 = \pi$ sq.units
Que:79	
2x + 5 is an increasing function and 14 – x is a decreasing function. Min [max (2x+5, 14 – x)] occurs when the increasing and decreasing functions become equal. ∴ 2x + 5 = 14 – x ⇨ 3x = 9 ⇨ X = 3 Substituting x = 3 in any of the functions = 2(3) + 5 =11	
Que:80	
Let AD be perpendicular to BC, the largest side. Area of triangle ABC = 152 ⇨ $\frac{1}{2}$(38) (AD) = 152 ⇨ AD = 8	

AS ABCD is right angled triangle, $AB^2 = AD^2 + BD^2$

- ⇨ $100 = 64 + BD^2$
- ⇨ BD = 6
- ⇨ CD = 32
- ⇨ Also $\Delta\ ADC$ is aright angled triangle.
- ⇨ $AC^2 = (32)^2 + (8)^2$
- ⇨ $AC = \sqrt{1088} = 8\sqrt{17}$

Que:81

Let the amounts with Anna, Ben and Clark be Rs. A, Rs. B and Rs. C respectively.

a + b + c = 100

4(a-13) = b+13

3(c-7) = b+7

Solving these equations, we get a = Rs. 28, b = Rs. 47, and c= Rs. 25

Let the sum that Ben need to give to Clark be Rs. X such that they have the same amount.

47-X = 25+X or, X=11.

Que:82

Model	Revenue from Sales	Revenue from Service
Brio	6.4% of 20 = 1.28	30.5% of 12 = 3.66
Jazz	10.15% of 20 = 2.03	24% of 12 = 2.88
Civic	9% of 20 = 1.8	18.2% of 12 = 2.184
City	18% of 20 = 3.6	15% of 12 = 1.8
Accord	30% of 20 = 6	6.1% of 12 = 0.732
CR-V	26.45% of 20 = 5.29	6.2% of 12 = 0.7444

Combined revenue, Rs. 6,732 Cr, is highest for Accord.

Que:83

Volume of cars sold of Brio = $\frac{6.4}{100} * \frac{20}{4}$

Of Jazz = $\frac{10.15}{100} * \frac{20}{5.8}$

Of Civic = $\frac{9}{100} * \frac{20}{7.2}$

Of City = $\frac{18}{100} * \frac{20}{12}$

Of Accord = $\frac{30}{100} * \frac{20}{20}$ Of CR-V = $\frac{26.45}{100} * \frac{20}{23}$ It can be seen that the least number of cars sold is of CR-V, which is equal to 23.	
Que:84	
Say the no. of cars sold of the six brands is $6k_1$, $7k_1$, $5k_1$, $6k_1$, $6k_1$, $5k_1$ respectively. Say the no. of cars serviced of the six brands is $6k_2$, $7k_2$, $5k_2$, $6k_2$, $6k_2$, $5k_2$ respectively. Sum of revenue per car from sales and from service. $= \frac{6.4\%}{6k_1} + \frac{30.5\% \ of \ 12}{6k_2}$ Revenue obtained per car of Jazz $= \frac{10.15\% \ of \ 20}{7k_1} + \frac{24\% \ of \ 12}{7k_2}$ Similarly the expressions for other cars can be written. Unless some relation between k_1 and k_2 is known, the expressions cannot be determined. $\therefore$ *It cannot be determined.*	
Que:85	
Say 3 stations are chosen from the 38 intermediate stations between Gudivada and Yaddanapudi such that they are not consecutive. There are 35 remaining stations, which will have 36 gaps. ⇨ The 3 stations should have been chosen from the 36 gaps. ⇨ ∴ No. of ways = $^{36}C_3$ = 7140.	
Que:86	
If the root are real, then discriminate ≥ 0 ⇨ $p^2 - 4 * 12 \geq 0$ ⇨ $p^2 \geq 48$ ⇨ $\|p\| \geq \sqrt{48}$ ⇨ $\|p\| \geq 4\sqrt{3}$ But p is the sum of the roots $\propto_1$ & $\propto_2$ ⇨ $\|\propto_1 + \propto_2\| \geq 4\sqrt{3}$	
Que:87	
The equation of the passing through (3,5) and (2,2) is $y - 2 = \frac{5-2}{3-2}(x - 2)$ or $3x - y = 4$.	

Now since the point (a+1, 3a – 1) satisfies the above equation i.e. 3(a + 1) – (3a - 1) = 4. So any real value of 'a' will satisfy the above equation.

Que:88	

$f(1 + 1) = f(2) = f(1)\, f(1) = f^2(1) = 16^2$

$f(3) = f(2)f(1) = 16^2 * 16 = 16^3$

$f(4) = 16^4$

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$f(x) = 16^x$.

$\therefore f\left(\frac{3}{4}\right) = 16^{\frac{3}{4}} = 8$

Que:89	

Using statement 1 alone, the possible number of students in the class can be 19, 18, 17... To 5. So it is not sufficient alone

Using statement 2 alone, the possible number of students in the class are 13, 14, 15,...Again not sufficient alone.

Even if we combine both, we get multiple values possible. Hence, no unique answer.

Que:90	

Using Statement 1 alone, B & C together earns $350. Individual salary of them can't be unique and we can't conclude the highest value

Using statement 2 alone, A & C earns $250 combined. Now the highest has to be 250$ which is drawn by B as A & C both earns less than 250$.

So, statement 2 alone is sufficient.

Que:91	

Using statement 1 alone, the sixth men height is 5 feet, which alone is not sufficient to say anything about the height of 5th men in the queue (From front end of the line)

Using statement 2 alone,

Height of 6^{th} man = 4* Height of 5^{th} man — (1)

Height of 7^{th} man = 8* Height of 6th man — (2)

Even after solving both equations, we can get a absolute value as both equation give only relation and no absolute value,

Combining both statements, we can get a unique.

Que:92

Using statement 1 alone, the total area of the square can be derived. The shaded portion will be ¼ of the total area. Hence, alone 1 is sufficient.

Using statement 2 alone, the diagonal length is given. Diagonal of square is always square root of 2 times the length of square. We can hence derive the area and the shaded portion will be 1/4th of the total and a unique answer can be derived. Hence, alone 2 is also sufficient.

Que:93

Using statement 1 alone, R>Q. We can't say anything about P>Q. Hence, 1 alone is not sufficient.

Using statement 2 alone, R>P. Again we can't say anything about P>Q. Hence, statement 2 alone is not sufficient.

Combining both statements, R > P and R>Q. But we cannot get a unique relationship between P and Q.

Both are not sufficient.

Que:94

Age of Thomas can be 8, 27 or 64.

Using statement 1 alone, the only age possible is 27. Hence, 1 alone is sufficient.

Using statement 2 alone, the only possible age is 64. Hence, 2 alone is sufficient.

Que:95

Average number of applications received

$= \frac{\text{Total Number of applications received}}{4}$

The % change in the average number if applications received per university is same as that for total number of applications. In 2007, total number of applications = 18926 + 16723 + 18428 + 19201 = 73, 276.

In 2009, total number of applications received = 85701. % Increase = 85701-73728 / 73728 * 100= 16.95%.

Que:96	
For University R, % increase in applications from 2006 to 2007 = $\frac{184-157}{157}$* 100 = 17% Similarly, 2007 to 2008 is 12%, 2008 to 2009 is 4% and 2009 to 2010 is 9%. Least % increase occurred in 2009.	
Que:97	
41n = $(40 + 1)^{n}$. This means x = number of factors of 40 which is equal to 8.	
Que:98	
Go by options, option 1 is eliminated as she cannot offer all the flowers. Take option (4) Let flower be n. After putting into the water = 2n. 1/4th of 2n offered to the first place of worship = 2n/4. Remaining 3n/2. After putting 3n/2 flower into water they become 3n flowers, ¼th of 3n offered to the second place of worship. Remaining = 9n/4. Hence required ratio= 2n/4: 9n/4 = 2: 9.	
Que:99	
p can be 3 or 7, but unit digit of $(p + 1)^2$ = 4. p = 7. Hence unit digit of $(7 + 2)^2$= 1.	
Que:100	
As the given equation has imaginary root, they will be conjugate to each other. ln this case, both roots will be common or a: b: c = 1: 2: 3.	
Que:101	
A_{20}= 1 + 3 + 5 +… 20 terms = 20/2 [2 + 19*2] = 400. So the first term of A_{21} is 401.	
Que:102	
In order to form a pair, the first female will (n -1) trials, the second (n-2) trials and so the total number = n (n-1)/2.	
Que:103	
In the given progression, first term = 19, common difference = 18.5 - 19 = -4/5. Since the common difference is negative, each successive term is decreasing and here will be negative terms. Let nth term be the first negative term. Then nth term < 0 =>an<0 = a1 + (n-1) d<0. Solving for n we get n=25. Here, 25th term is the first negative tem and the first 24 terms will be non-negative. The sum will	

be maximum if no negative terms are taken. So, summing up to the 24 terms will be considered. Maximum sum = S24 = 24/2 * [2(19) + 24 -1) (-4/5)] = 235.5.	
Que:104	
The given term is constant and there cannot be minimum and maximum value of a constant term.	
Que:105	
For all values of n, we get f (n)= 1/n. So the required answer = 1 + 2+ 3 + ...+ 9= 45.	
Que:106	
Using statement 1 alone, Since m- n is a multiple of 22, m-n is multiple of 11 and 2 (11*2 =22). If both m and n are multiples of 11, then their sum is also multiple of 11. However, if m and y are not individually divisible by 11, it is possible that m –n is a multiple of 22 while m + n is not a multiple of 11. Hence, alone 1 is not sufficient. Using statement 2 alone, possible values are 11, 22,...,99. Since each of the values is a multiple of 11, m must be a multiple of 11. Now if both m and n are multiples of 11, (m + n) and (m - n) will be a multiple of 11. Hence, statement 2 alone is sufficient.	
Que:107	
| 2x – 19 | < 7, implies that -7< | 2x – 19 | < 7, implies that x>13 or x <13. Hence statement 1 alone is not sufficient. Statement 2 implies that x=0 or x=4. Hence, not sufficient. Even after combining both the statements, unique solution cannot be obtained.	
Que:108	
Using statement 1 alone, 3x + 5y =11 can't derive unique relation between x and y (if x = 2, y = 1 => x > y & if x = (-2), y = 7 => x < y. Hence 1 alone is not sufficient. The odd power of x is greater than the odd power of y. It implies that x is greater than y and hence sufficient.	
Que:109	
For any n, 199^{2n} has last digit as 1. But the last digit of 144^{2n} is 4 for odd values of n and 6 for even values of n. Therefore, last digit of the expression is either 5 or 7.	
Que:110	
Relative speed of A and B will be 20 m/min to cover the track of 960m. It will take 48 min.	
Que:111	

Let’s assume the total amount of work = 32 units.

So A and B does 2 units per day. A does 1 unit per day so B does 1 unit per day. Hence, 32 units of work will be completed in 32 days.