1. One year before Pamela's age was 4 times of her daughters age. After 6 yrs Pamelas age will be 9 yrs more than twice the age of her daughter. What is her daughters present age?

Solution:

Let the present age of Pamela be 'a' and her daughter's present age be 'b'. (When you deal with age problems, always assign the variables corresponding to the current age)

So, One year before,
Pamela's age = a – 1
daughter's age = b – 1

Pamela's age was 4 times of her daughter's age.
This can be written as a - 1 = 4(b-1) ("times" implies multiplication)
a – 4b = -3 ---------- eqn 1.

After 6 years,
Pamela's age = a + 6
Daughter's age = b + 6
After 6 yrs, Pamela's age will be 9 yrs more than twice the age of her daughter's.
This can be written as

a + 6 = 9 + 2(b+6) ("more than" implies addition)
a – 2b = 15 ---------- eqn 2.
Solving (1) and (2), we get

b = 9 and a = 33
Age of Pamela's daughter = 9 yrs.

2.At an ice cream store, $20 is enough to buy 5 cones and 5 sundaes. Or $20 can buy 4 sundaes,6 cones and there would be 80 cents left over. How much more expensive is a sundae compared with a cone?

Solution:

Let the cost of a cone be 'c' and a sundae be 's'.

$20 cents are enough to buy 5 cones and 5 sundaes.

5c + 5s = $20
c + s = 4 -------> eqn 1

When 4 sundaes and 6 cones are bought, 80 cents (= $0.8) would be left over.

6c + 4s + 0.8 = 20
3c + 2s = 9.6 ----------> eqn2

Solving eqn 1 and 2.

we get c = $1.6

s = $2.4
s – c = $0.8
A Sundae is $0.8 more expensive than a cone.

3.The staff members of an athletic department at a college agreed to contribute equal amounts to make up a scholarship fund of 200$. Since then,two new members have been added to the staff, as a result, each members share has been reduced by 5$.How many members are now on the staff?
Solution:

Observe that the scholarship fund $200 is fixed irrespective of number of staffs.
Let the number of staff members be 'n'.
Each members share = 200 / n.
Two members have been added to the staff.
Share of each members = 200/(n+2)

New share is $5 less than the previous share.

This can be written as 200/(n+2) = (200/n) – 5
Solving for n, we get n = 8 or n = - 10.
Number of members can not be negative.
So, the number of staff members, n = 8.
After adding two more members, the number of members, n + 2 = 10.

4.A gardener sets 180 plants in row. Each row contains the same number of plants. If there were 40 more plants in each row, the gardener would need 6 fewer rows. How many rows are there?

Solution:

Total number of plants = 180.
Let the number of rows be 'r' and the number of plants in each row be 'p'.
So, the total number of plants = r * p = 180. --------> eqn 1

If there were 40 more plants in each row, the number of rows would have become r – 6.
The number of flowers in each row is p + 40

So, the total number of flowers = (r-6)*(p+40) = 180. --------> eqn 2
Solving for r from (1) & (2), we get

r = 9 or r = -3.
Number of rows can not be negative. So, r = 9.
The number of rows = 9.

5. A demographic survey of 100 families in which two parents were present revealed that the average age P, of the oldest child is 10 yrs more than 1/3 the sum of the ages of the two parents. If F represents the age of one parent and M the age of the other parent then which of the following is equivalent to p?
A..F+M/3 - 10 B. F + M/2 -10

Solution:

Given:
P is the age of oldest child.
F is the age of one parent.
M is the age of other parent.

Look! The question is asking for an expression (and not the value).
Do it by considering the question, phrase by phrase.

Sum of the ages of the two parents = F + M
1/3 of the sum of the ages of the two parents = (F+M)/3.
10 yrs more than sum of the ages of the two parents = 10 + (F+M)/3

The age of the oldest child (P) is 10 yrs more than 1/3 of the sum of the ages of the two parents.

P = 10 + (F+M)/3

This is the representation of P.

Check with the choices. The choices given doesnt go with the expression.

Q:1
The average cost of an apple is $0.20 for first 10 apples after this the cost of apple will be $0. 16 if Nikki wants to buy an apple at an average price of 17 cent how many apple does she have to purchase?
Option-(a)10 (b)20(c)35(d)40(e)30

Given:

The question says there are many apples, but when nikki buys them, the cost of the first 10 apples is little higher to the cost of the rest of the apples.

Its given that, the average cost of first **10 apples** is 20 cents each. Thus, total cost of 10 apples
= 10 × 20 = **200 cents** = $ 2. ---------- (1)
For the remaining apples, say p, avg cost of an apple = 16 cents.
Cost of **p** apples = **16*p** ---------- (2)

Thus Nikki buys **10 + p** apples, at an avg cost of 17 cents/apple. (Given)
ie avg cost of an apple = {**(10+p) * 17**} / (**10 +p**)
= (**170 +17p**) / (**10 +p**) (Agree?) ---------- (3)

But what does (1) and (2) say?
Combining (1) and (2), we get the number of apples = **10 + p** at the cost of **200 + 16*p**.
Therefore avg cost of an apple is = (**200 + 16*p**) / (**10 + p**) ---------- (4)

From (3) and (4), what do you say?
Both the eqn gives the avg of an apple when the total number of apples is 10 + p.
Hence equate both,

(170 +17p) / (10 +p) = (200 + 16*p) / (10 + p)

Implies 170 +17p = 200 + 16*p
solving for p, we get, p = 30 apples
Thus total number of apples is 30 + 10 = 40 apples!
Choice D: 40 is the correct answer.

Q.2
The average marks of a student in 6 subject is X. If the maximum and minimum marks are excluded, the average of marks in remaining subject is X - 1. If the minimum no. of marks scored by him in a subject is 90, what is the maximum no of marks scored by him if X= 90?
Option-(a)90(b)89(c)80(d)86(e)94

Given:
The avg mark of a student in 6 subjects = X = 90. (Given)
implies total marks he got in 6 subjects = 90 * 6 = 540 ---------- (1)
But if the maximum and minimum marks are excluded, then the avg of the remaining 4 subjects is given as = x-1 = 89.
implies total marks he got in 4 subjects = 89 * 4 = 356 ---------- (2)

Total marks in 6 subjects = (total marks of 4 subjects + maximum mark + minimum marks) = 540.
= 356 + 90 + maximum mark = 540

Thus maximum mark, he got = 540 – 446 = 94
Choice E: 94 is the correct answer.

Q3
Some children sitting in a row. The nth child has n^2 (n ka square) chocolate and every child has an average of 46 chocolate. How many children are sitting in the row?
Option (a)9(b)10(c)11(d)12(e)8

Given:
The question says, the first child takes $1^2 = 1$ chocolate, the 2nd child takes $2^2 = 4$ chocolates, etc.. and the
nth child takes n^2 chocolates.

But the average number of chocolates = 46. ---------- (1)

The total number of chocolates = $1^2 + 2^2 + 3^2 + \ldots + n^2 = \frac{n[n+١][٢n+١]}{٦}$ *(Formula to find the sum of the square of the first n numbers)*

Average number of chocolates = {[n][n +1][2n +1]/6 }/n

$= \frac{[n+١][٢n+١]}{٦}$

But $\frac{[n+١][٢n+١]}{٦}$ = 46 (From 1)

$2n^2 + 3n + 1 = 276$ (Solve this quadratic equation)

Solving the above quadratic equation, we get two values for n.

They are n = 11 and n = -12.5

Since n = number of children which can not take negative values, n = 11.

Hence Choice C is the right answer

Q.4
The average salary of a man for the first 6 months of a year is $ 4000 per month, In this period, his average expenditure is $2500 per month. For the next 6 month his expense doubled. What should be the percentage of increase in his average salary in these 6 months so that his average saving are the same for the first and second half of the year?
Option-(a)40%(b)33.33%(c)62.5%(d)100% (e)30%
Explanation:

In the first 6 months:
Salary = $4000
Expense = $2500
Savings = 4000 – 2500 = $1500

In the next 6 months:
Expense is doubled ====> expense = 2 x 2500 = $5000
Savings (is same as prev) = $1500
Salary = expense + Savings
= 5000 + 1500 = $6500.

To find: Percentage increase in his average salary in the second 6 months.

Increase in salary = 6500 – 4000 = 2500

% of increase = $\frac{٢٥٠٠}{٤٠٠٠} \times ١٠٠$ = 62.5%

choice C is the right answer.

Q.5
Ten years ago the average age of a family of 4 member was 25 years. However a boy was born 5 years back in the family. What is the average age of a family?
Option-(a)32(b) 28(c)30(d)29(e)33
Explanation:
Consider your present age. Let it be 25 (say).
What would be your age after 10 years?
Is it not 35?
What was your age before 8 years?
Is it not 17?

what do you observe?
The number of years is added/ subtracted along with your age, depending on future or past your take.

	Avg age of the family	Number of people	Total age
10 years before:	25	4	25 * 4 =100
10 years after (ie now)	?	5	100 + 40(for 4 persons the increase age for 10 years) + 5 (The age of the born baby) = 145

Therefore average age of the family = $\frac{١٤٥}{٥}$ = 29 years.

Hence Choice d: 29 is the right answer.

Q6
The average of 10 numbers is 20. If a number, equal in value to the maximum number out of the given ten numbers, is added, the average increase by 1. If the maximum number itself is deleted, what will be the average?
Explanation:

When you see multi set of statements involving same concept (or formula), solve it using a table which helps you to solve easily and quickly. It avoids many confusion too.

Observe the given table. If you find it difficult to understand it, do let me know.

	Avg	Number of observations	Total
	20	10	200
Max value is added again	21	11 (10 observations + max value)	231 implies the max value = 231 – 200 = 31
Max value is removed	?	9 (10 observations – max value)	200 - 31 = 169

Average of 9 numbers = $\frac{٢٠٠ - ٣١}{٩}$ = 18.8