Week Thirty-six problems and solutions

Question 1.

In 4 years, Jatinder will be twice as old as he was two years ago. How old is he now?

Solution

Let A be the current age of Jatinder, then Jatinder's age in 4 years is A + 4 and his age 2 years ago was A – 2
Then A + 4 = 2(A – 2) i.e. A + 4 = 2A – 4
A = 8, So, Jatinder's age is 8

Question 2.

John, Sally and Fiona are selling tickets for a charity event. John has sold 5 more tickets than Sally who has sold half as many tickets as Fiona. They have sold a total of 101 tickets. How many tickets has each person sold?

Solution

Suppose Sally has sold s tickets then John has sold s + 5 tickets and Fiona has sold 2s tickets.
So, (s + 5) + s + 2s = 101
4s + 5 = 101
4s = 96
s = 24
So, John has sold 29 tickets while Sally has sold 24 and Fiona 48.

Question 3.

A particular cleaner killed 99.9% of a bacterial population which then went on to double every 20 minutes. Estimate how long will it be at that rate of growth before the bacterial population reaches its previous level.

Solution

If the bacterial population before cleaning is p, then after cleaning it is 0.001p

After n lots of 20minutes the bacterial population will be 2^n x 0.001p

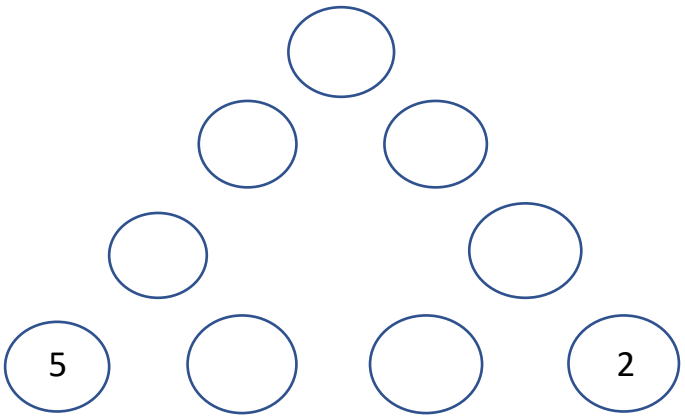
We require p = 2^n x 0.001p i.e. 2^n = 1000

2^10 = 1024.

So, n is approximately 10 and the time taken is about 10 x 20 = 200 minutes.

Question 4.

In the diagram below each circle contains a digit from 1 to 9 and each contains a different digit. The sum of the digits in each line of four circles is the same. What is this sum?



Solution

The sum of the numbers 1 to 9 is 45.

Let the digit in the top circle be x.

Then the total from all three lines is 45 + 2 +5 + x = 52 + x.

All the lines have the same sum so 52 + x is divisible by 3.

So, x is 2, 5, or 8.

But 2 and 5 have been assigned; so x = 8 and the sum of each line is (52 + 8) /2 = 60/3 = 20.