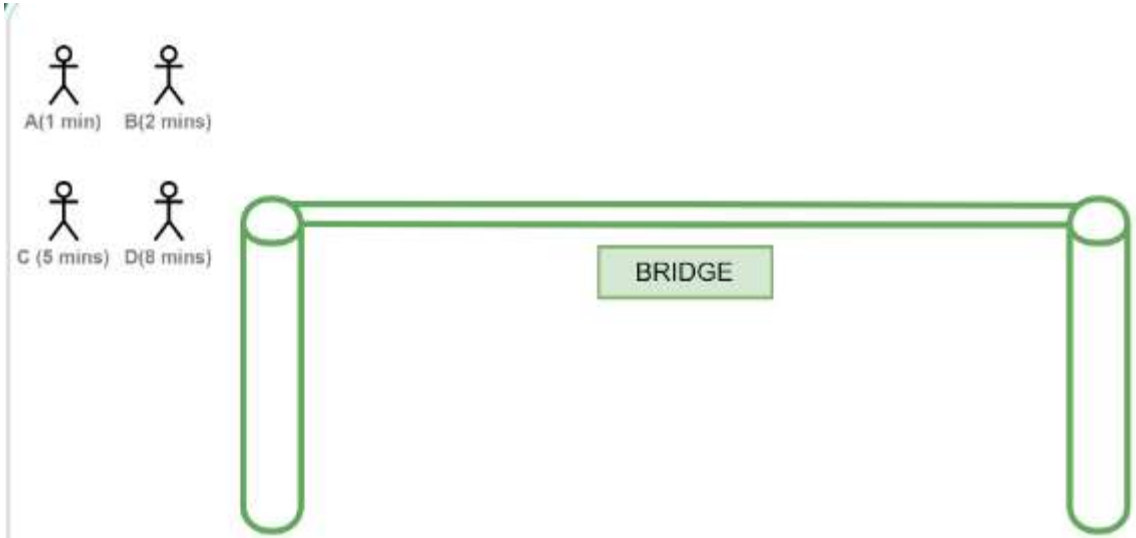
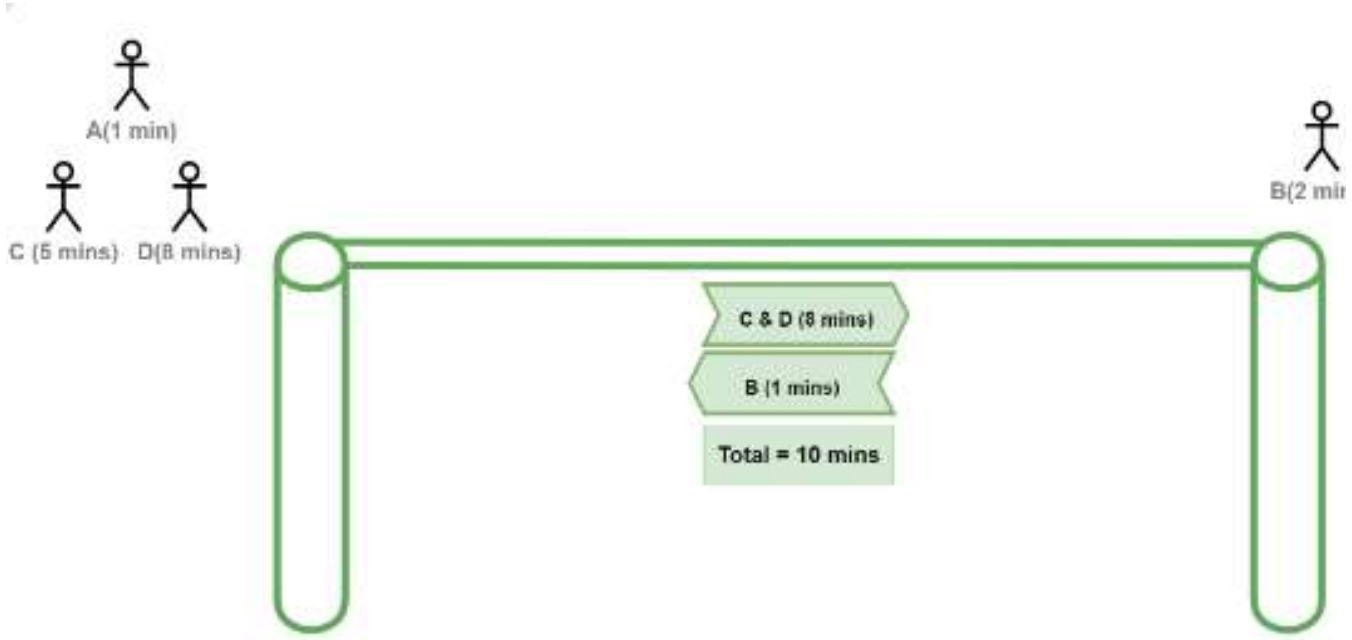
Numerical Puzzles

1. There are 4 persons (A, B, C and D) who want to cross a bridge in night.
A takes 1 minute to cross the bridge.
B takes 2 minutes to cross the bridge.
C takes 5 minutes to cross the bridge.
D takes 8 minutes to cross the bridge.
There is only one torch with them and the bridge cannot be crossed without the torch. There cannot be more than two persons on the bridge at any time, and when two people cross the bridge together, they must move at the slower person's pace.



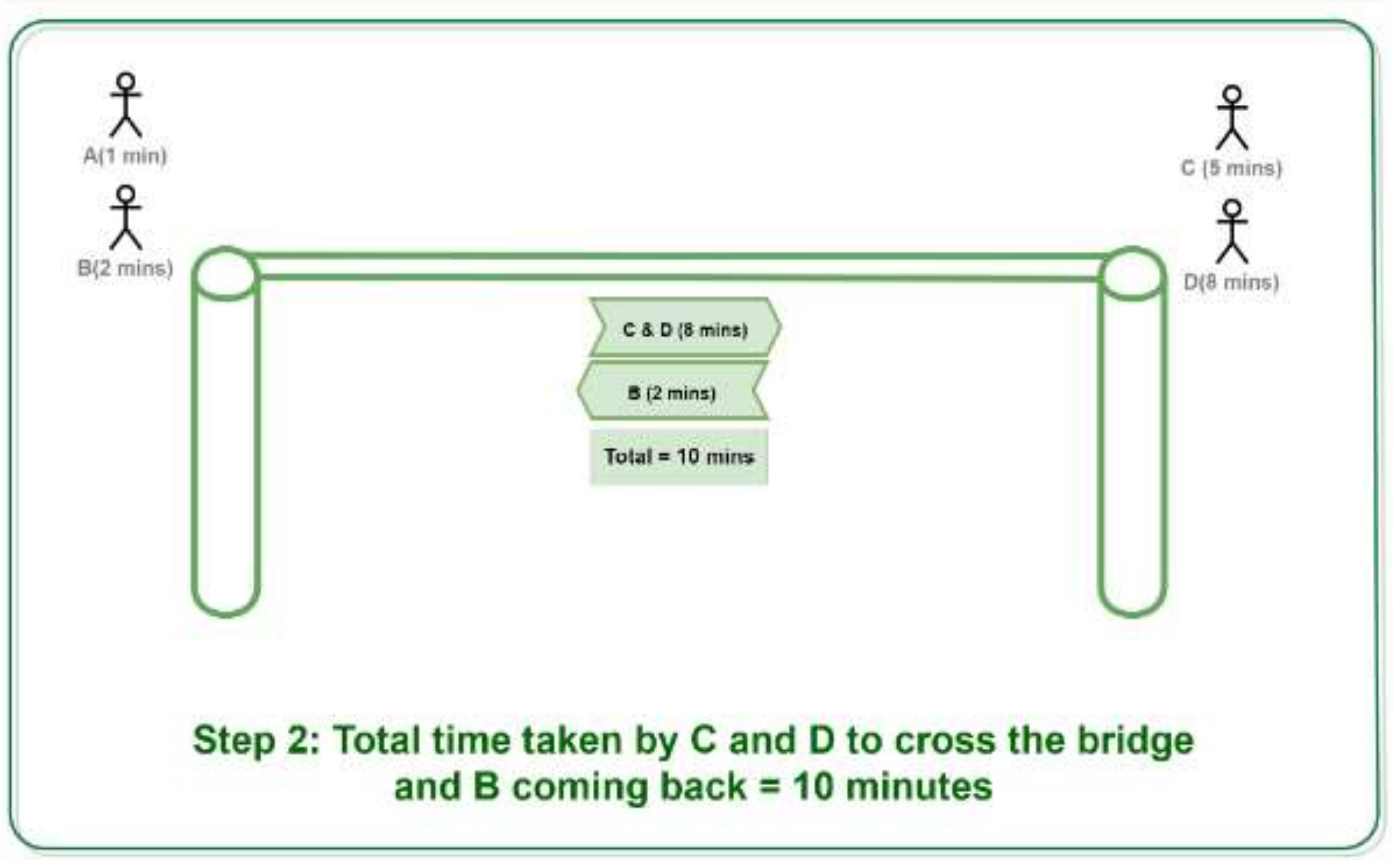
4 persons A, B, C and D wants to cross the bridge. At most 2 people can cross the bridge at a single time

They must cross the bridge in the following way:
Step 1: A and B cross the bridge. A comes back. Time taken **3 minutes**. Now B is on the other side.

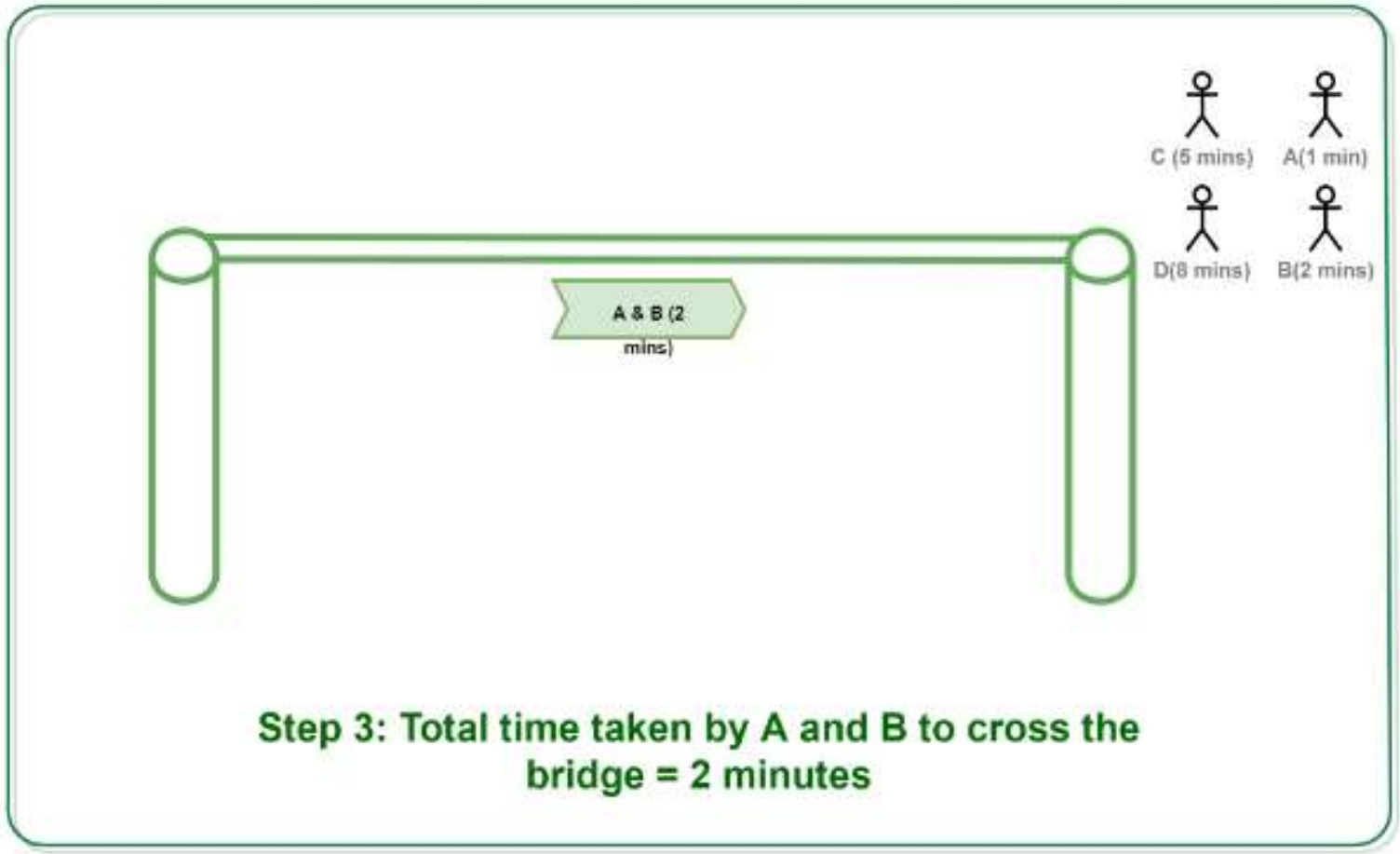


Step 1: Total time taken by A and B to cross the bridge and A coming back = 3 minutes

Step 2: C and D cross the bridge. B comes back. Time taken **8 + 2 = 10 minutes**. Now C and D are on the other side.



Step 3: A and B cross the bridge. Time taken is **2 minutes**. All are on the other side.



2. At a farewell party, people were asked to guess how many marbles there were in a box.
No one guessed correctly, but the nearest guesses were 171, 177, 186 and 190.
The correct number of marbles was one unit away from one of the closest guess, three units away from another, ten units away from the third and sixteen units away from the remaining closest guess.
How many marbles were there in the box?

a. 178
b. 181
c. 187
d. 189

The jar contained 187 marbles. One way to do this is to draw a number line between 171 and 190 and test each number to see if it works. Otherwise take a few guesses until you get it!

3. Upender has 22 pairs of Black gloves and 22 pairs of blue gloves. He keeps them all in the same drawer. What is the minimum number of gloves required to make a matching pair?

A. 23
B. 44
C. 45
D. 40

In the worst scenario 44gloves are of one hand say of left hand. Now the 45th glove will be of right hand and will make a pair.

4. There are 70 teachers employed with Temple of Learning, of which 30 are females.
(1) 30 teachers are married.
(2) 24 teachers are above 31 years of age.
(3) 19 married teachers are above 31 years of which 7 are males.
(4) 12 males are above 31 years of age.
(5) 15 males are married.
How many of unmarried females are above 31 years of age?

A. FOUR
B. NONE
C. FIVE
D. TEN

Total there are 30 females and 40 males. Out of females 15 are married and out of these 15, twelve females are of above 31 years of age, 15 females are unmarried . Out of males, 15 males are married, out of these 15, seven males are above 31 years of age and 25 males are unmarried and out of these 25 males, 5 males are above 31 years of age. **Thus, no unmarried female (0) is above 31 years of age.**

	Married, above 31 years	Married, below 31 years	Unmarried, above 31 years	Unmarried, below 31 years	TOTAL
Males	7	8	5	20	40
Females	12	3	0	15	30
TOTAL	19	11	5	35	70
	30		40		

5. **ABCDE×4=EDCBA**.

What are the values of A, B ,C, D and E?
It has to be a five digit number and each has to be a unique nuber.

Since EDCBA is a 5-digit number, we know ABCDE is $< 1/4 \times 100000$.
ABCDE < 25000, so A is 1 or 2.

But EBCDA is a multiple of 4, so it is even, so A = 2.
4 * ....E = ...2, so E is either 3 or 8.
But, $4 \times$ 2nnnn cannot be 3nnnn so E is 8.

We have 2BCD8 * 4 = 8DCB2.
and therefore $4 \times$ BCD + 3 = DCB.
Let's look at it case by case, for values of D:
D = 1, B = 7
D = 2, B = 1
D = 3, B = 5
D = 4, B = 9
D = 5, B = 3
D = 6, B = 7
D = 7, B = 1
D = 8, B = 5
D = 9, B = 9
D = 0, B = 3

But B cannot be greater than 2, or there would be a carry, and B cannot be equal to 2, since A = 2 (and we assume each letter represents a different number).
So, B = 1 and D = 2 or 7.
But again, A is already 2, so D = 7.

So we have 21C78 * 4 = 87C12
We now have 4 * C + 3 = C (mod 10)
3*C = 7 mod 10
and therefore C = 9
So the answer is 21978 * 4 = 87912

6.Forty students are standing in a single row such that after the first boy, there is one girl. After the second boy, there are two girls. After the third boy, there are three girls and so on. Work out the number of girls in the second-half of the row.

a. 12
b. 14
c. 18
d. 16

The arrangement in the parking:
B+G+B+2G+B+3G+B+4G+B+5G+B+6G+B+7G+B+5G=
40 Students. So number of girls in the second half of the row = 6+7+5=18.

7. If GOOGLE is coded as 4 and ABSENTEE as 6, then what is the code for LETTERS?

a. 6
b. 7
c. 5
d. 8

Each word is coded by the number of different alphabets present in the word (no repetition). Number of different alphabets in "LETTERS" are 5.

8.A factory was cutting rolls of 1m length from a 200 m roll. How long would it take for the machine to cut the rolls if each cut took 4 seconds?

A. 13 MIN 23 SECS
B. 14 MIN
C. 13 MIN 16 SECS
D. 12 MINS 56 SECS

Length of roll to be cut =200 m
Length of sub rolls to be cut=1m each
So, total no of sub rolls to be cut=200
No of cuts required=200-1=199
Time taken for each cut=4 seconds
Total time required for 199 cuts=199x4=796 seconds=13 minutes & 16 seconds

9. Using Four 7's And one 1 Create The Number 100

For this exercises you may use
*the **addition**, **subtraction**, **multiplication** and **division** operators along with **parentheses**.*

Answer 1:177 – 77 = 100 ;
Answer 2 : (7+7) * (7 + (1/7)) = 100 ;

10. If you have a 5-litre jug and a 3-litre jug, how would you measure exactly 4 litres?

Solution 1 :

1. First fill 3Lt bottle completely and pour 3 litres into 5Lt bottle.
2. Again fill 3Lt bottle completely. now pour 2 litres into 5Lt bottle until it becomes full.
3. Now empty 5Lt bottle.
4. Pour remaining 1 litre in 3Lt bottle into 5Lt bottle.
5. Now again fill 3Lt bottle completely and pour 3 litres into 5Lt bottle.
6. Now you have 4 litres in 5Lt bottle. That's it.

Solution 2 :

1. First fill 5Lt bottle completely and pour 3 litres into 3Lt bottle.
2. Empty 3Lt bottle.
3. Pour remaining 2 litres in 5Lt bottle into 3Lt bottle.
4. Again fill 5Lt bottle completely and pour 1 litre into 3 Lt bottle until it becomes full.
5. Now you have 4 litres in 5Lt bottle. That's it.

11. Alok has three daughters. His friend Shyam wants to know the ages of his daughters. Alok gives him first hint.

1) The product of their ages is 72.
Shyam says this is not enough information Alok gives him a second hint.

2) The sum of their ages is equal to my house number.
Shyam goes out and look at the house number and tells “I still do not have enough information to determine the ages”.
Alok admits that Shyam can not guess and gives him the third hint
3) The oldest of the girls likes strawberry ice-cream.
Shyam is able to guess after the third hint. Can you guess what are the ages of three daughters?

Product of ages is 72
Below are all possibilities to get 72 from product of three different ages:
1 * 1 * 72 = 72
1 * 2 * 36 = 72
1 * 3 * 24 = 72
1 * 4 * 18 = 72
1 * 6 * 12 = 72
1 * 8 * 9 = 72
2 * 2 * 18 = 72
2 * 3 * 12 = 72
2 * 4 * 9 = 72
2 * 6 * 6 = 72
3 * 3 * 8 = 72
3 * 4 * 6 = 72
2) Sum of the ages is given
1 + 1 + 72 = 74
1 + 2 + 36 = 39
1 + 3 + 24 = 28
1 + 4 + 18 = 23
1 + 6 + 12 = 19
1 + 8 + 9 = 18
2 + 2 + 18 = 22
2 + 3 + 12 = 17
2 + 4 + 9 = 15
2 + 6 + 6 = 14
3 + 3 + 8 = 14
3 + 4 + 6 = 13
All sums are unique except 14. So the age sum must have been 14, otherwise Shyam would have guessed the ages from hint 2 only.

So we have two possible combination to get sum 14
2 + 6 + 6 = 14
3 + 3 + 8 = 14

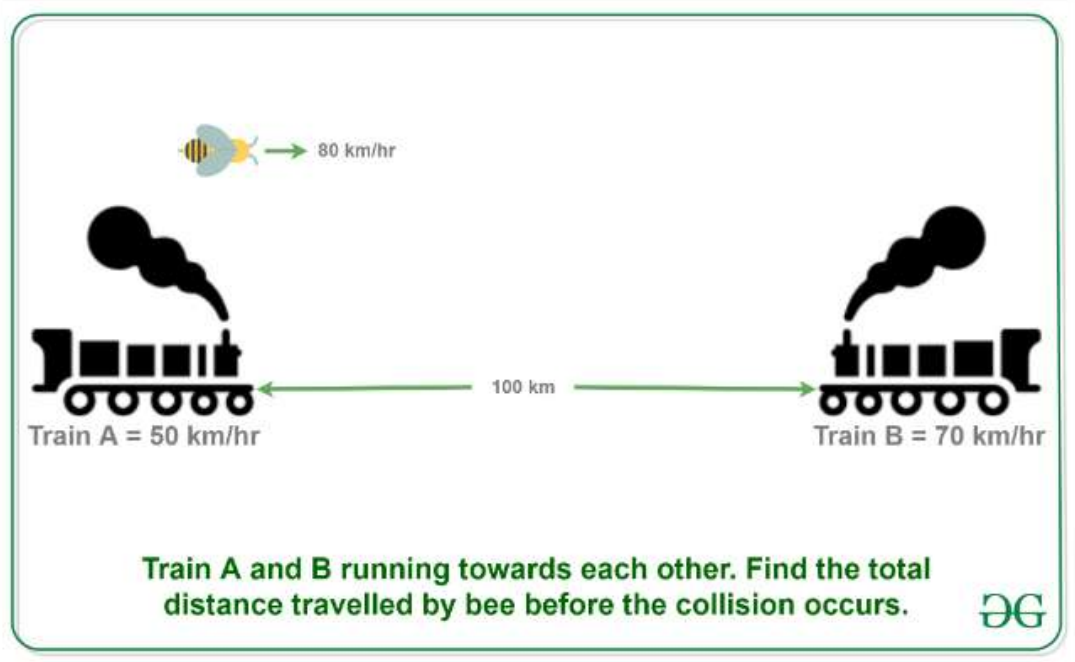
3) Alok has an oldest girl (not two!!). So the ages must be 3, 3 and 8.

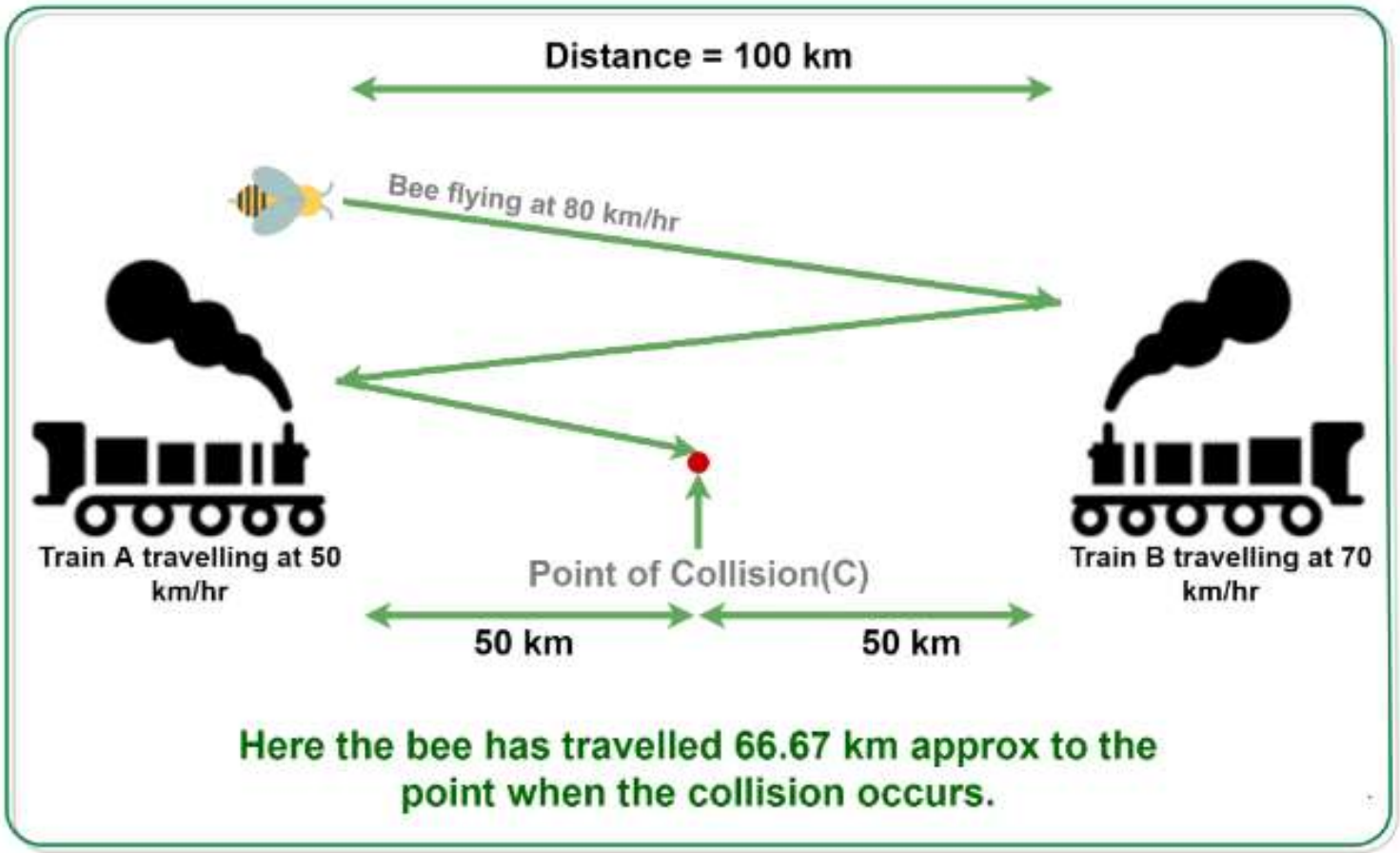
12. There are 10 stacks of 10 coins each. Each coin weighs 10 gms. However, one stack of coins is defective and each coin in that stack weights only 9 gms. What is the minimum number of weights you need to take to find which stack is defective? How?

a. 9
b. 1
c. 2
d. None of these

You only need to make ONE weighing.
Place 55 coins on the scale: one coin from stack #1, two from stack #2, three from stack #3 … up to ten coins from stack #10. Weigh the 55 coins together.
If all the coins were genuine, then the scale would show 550 grams, but we know that there have to be some counterfeit coins in the pile (because we took at least one from every stack.) Let's say that our stack of 55 coins weighs 544 grams. That's six grams short of 550, which means that six coins in the stack are bogus. That means that stack #6 is the one with the underweight coins, since that's the stack from which we took six coins. If the stack had weighed 549 grams, we'd be one gram short and so we'd know that stack #1 was the bad one, and so on.

13. Two trains are on same track and they are coming toward each other. The speed of the first train is 50 km/h and the speed of the second train is 70 km/h. A bee starts flying between the trains when the distance between two trains is 100 km. The bee first flies from first train to second train. Once it reaches the second train, it immediately flies back to the first train … and so on until trains collide. Calculate the total distance travelled by the bee. Speed of bee is 80 km/h.





- Let the first train A move at **u** km/h.
- Let the second train B move at **v** km/h.
- Let the distance between two trains be **d** km
- Let the speed of bee be **b** km/h
- Therefore, the time taken by trains to collide = **d/(u+v)**

Now putting all the known values into the above equation, we get,

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u = 50 km/hr
v = 70 km/hr
d = 100 km
b = 80 km/hr

Therfore, the total distance travelled by bee
= b*d/(u+v)
= 80 * 100/(50+70)
= 66.67 km (approx)
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14. There were 24 coins and a balance scale. The coins are identical in every way except that one of them is counterfeit and slightly heavier than the other 23 coins. What is the least number of weighings needed on the balance scale to determine which is the heavier coin?

This can actually be solved using three weighs
1.) Divide the 24 coins into 3 stacks of 8 and weigh two.
If the two stacks that are being weighed are equal, the third stack contains the counterfeit. If they are not equal, the heavier stack contains the counterfeit.
2.) Take the stack of eight and divide it into two stacks of three and one stack of 2. Now weigh the two stacks of three. If they are the same, the stack of two contains the fraud. If the two stacks of three are not equal, the heavier one contains the deceptive coin.
3.) you now either have two coins or three coins. Either way, compare two. If they are the same, the imposter is the third coin. If they are not equal, the heavier is the counterfeit.

15. A lady buys goods worth Rs.200 from a shop. (shopkeeper is selling the goods with zero profit). The lady gives him Rs.1000 note. The shopkeeper gets the change from the next shop and keeps Rs.200 for himself and returns Rs.800 to the lady. Later the shopkeeper of the next shop comes with the Rs.1000 note saying "duplicate" and takes his money back.

How much LOSS did the shopkeeper face?

The answer is Rs.1000

How?

Solution 1

To get the loss of shopkeeper we can get the profit lady and the other shopkeeper.

Loss of first shopkeeper = (Profit of the lady + Profit of the second shopkeeper)Profit of the lady = Rs.200(for goods) + Rs.800(for the change she received) = Rs.1000

Profit of the second shopkeeper = Rs.0(as he got his money back)

So the loss of the shopkeeper is = 1000 + 0 = Rs.1000

Solution 2

Second way of looking at is what shopkeeper gave to others and what is took from others

Loss of the shopkeeper = What he gave to others - what he took.What he took

From Lady: Nothing(as the note was a duplicate one)

From Second Shopkeeper: Rs.1000

What he gave

To Lady:- Rs.200(goods) + Rs.800(change)

To second shopkeeper: Rs. 1000

So the loss = (200 + 800 + 1000) - (1000) = Rs.1000