Answer on Question#36920 - Math – Other

Question.

From the first day of this month Paltu has started saving one 2 taka coin each day in a box. The box will turn on a red light if it contains 50 taka or more. On the ninth day, Paltu's father secretly put 5 coins of 2 taka in that box. On the other hand, Paltu forgot to save coins on the twelfth and the fifteenth day. In which date will the red light turn on just after putting the coin?

Answer.

At the first day of the month in a box is 2 taka. Use arithmetic progression to find what will be at the 9th day:

$$a_n = a_1 + (n-1)d,$$

where $a_1 = 2, d = 2\ (taka).n - a\ day.$

The 9th of the month:

$$a_9 = a_1 + (9-1)d = 2 + 8 * 2 = 18\ taka$$

As Paultu's father put 5 coins of 2 taka on the ninth day, we have that $18 + 5 * 2$=28 taka.

AsPaltu forgot to save coins on the twelfth and fifteenth day:

the 15th of the month: $a_{15} = 28 + (5-1) * 2 = 28 + 8 = 36$ taka.

Now, we should find the "day=n" when the red light turn on:

$$a_n = \widehat{a_1} + (n-1)d,$$

where $\widehat{a_1} = 36,\ d = 2.$

$$50 = 36 + (n-1) * 2$$

$$14 = 2(n-1)$$

$$7 = n - 1 \rightarrow\ n = 8.$$

So, $14 + 8 = 22$th day of the month the red light turn on.

Answer. 22