Assignment I - ICSE 10 2018 - Q9(a)

Kartheek Tammana

The various parameters given are listed in the following table:

Symbol	Description	Value
I	Interest	₹5550
P	Monthly Deposit	₹1000
r	Annual Interest Percentage	10%
n	Number of Months	?

We know the formula for interest on a recurring deposit is:

$$I = \frac{Prn(n+1)}{12 \cdot 2 \cdot 100} \tag{1}$$

$$\implies 5550 = \frac{1000 \cdot 10n(n+1)}{12 \cdot 2 \cdot 100} \tag{2}$$

$$n(n+1) = 1332 \tag{3}$$

$$n^2 + n - 1332 = 0 \tag{4}$$

$$n^2 + 37n - 36n - 1332 = 0 \tag{5}$$

$$n(n+37) - 36(n+37) = 0 \tag{6}$$

$$(n-36)(n+37) = 0 \tag{7}$$

So the solutions are $n = 36$ or $n = -37$. Discarding the negative solution, we get that the time of maturity is 36 months, or 3 years.

We can verify this answer by graphing the interest as a function of time, i.e.,

$$y = \frac{1000 \cdot 10x(x+1)}{12 \cdot 2 \cdot 100} \tag{8}$$

along with the interest at time of maturity $y = 5550$, and checking for the point of intersection (where y is the interest in rupees, and x is time in months). This can be seen in Fig. 1.

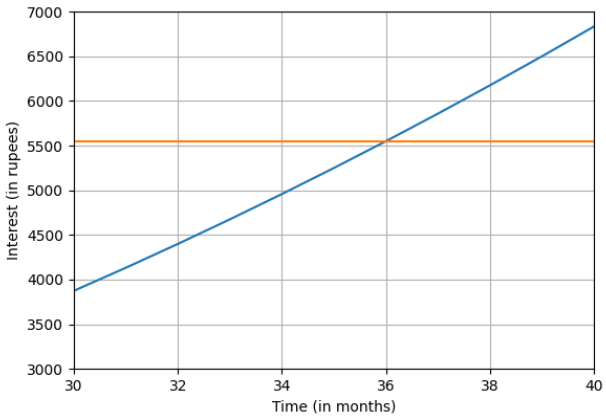

Fig. 1. Graph shows interest over time