Accumulated Value of an Annuity

An annuity is a sequence of payments into an interest-bearing account. In this exercise, you will write the **R** function `annuity` that calculates the accumulated amount in an interest-bearing account when a regular monthly deposit is made, given the original principal, the amount of each monthly deposit, and the interest rate, which is compounded monthly. The inputs to the function will be the original principal P, the nominal annual interest rate compounded monthly r, the amount deposited each month D, and the number of years T until the annuity matures. In that order.

The output will be the accumulated amount A in the interest-bearing account after T years. Your function will also plot a graph of the amount in the account.

Given an amount P in the interest-bearing account at the beginning of a month and a deposit D at the end of the month, the amount A at the end of the month in the account is given by the formula

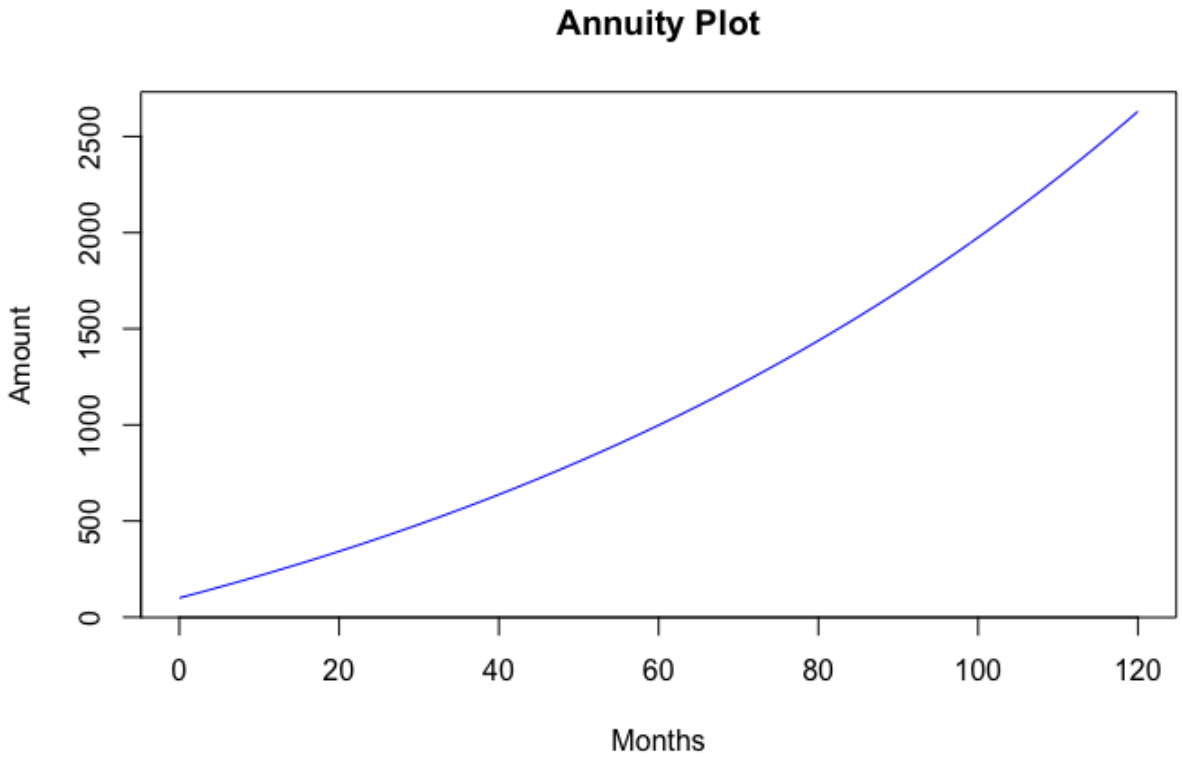
$$A = P\left(1 + \frac{r}{12}\right) + D,$$

where r represents the nominal annual interest rate compounded monthly.

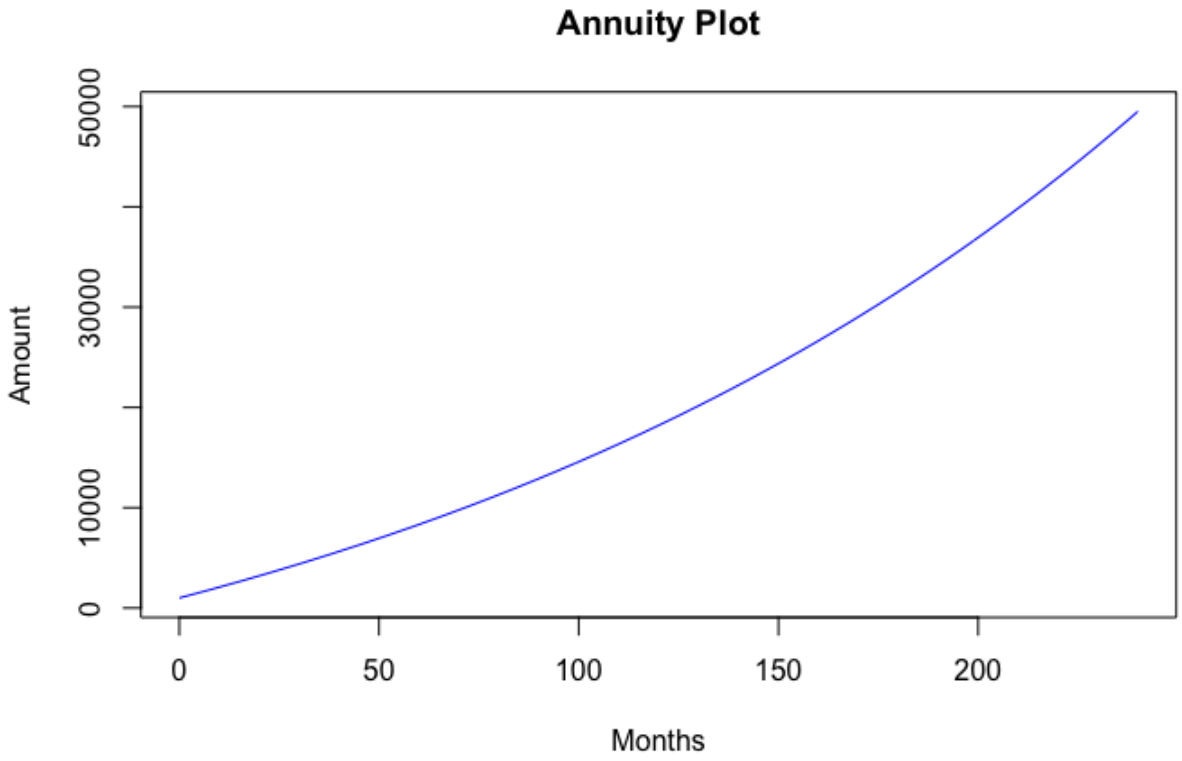
Finally, the function will plot a graph of the amount in the account after each month.

Here are several examples.

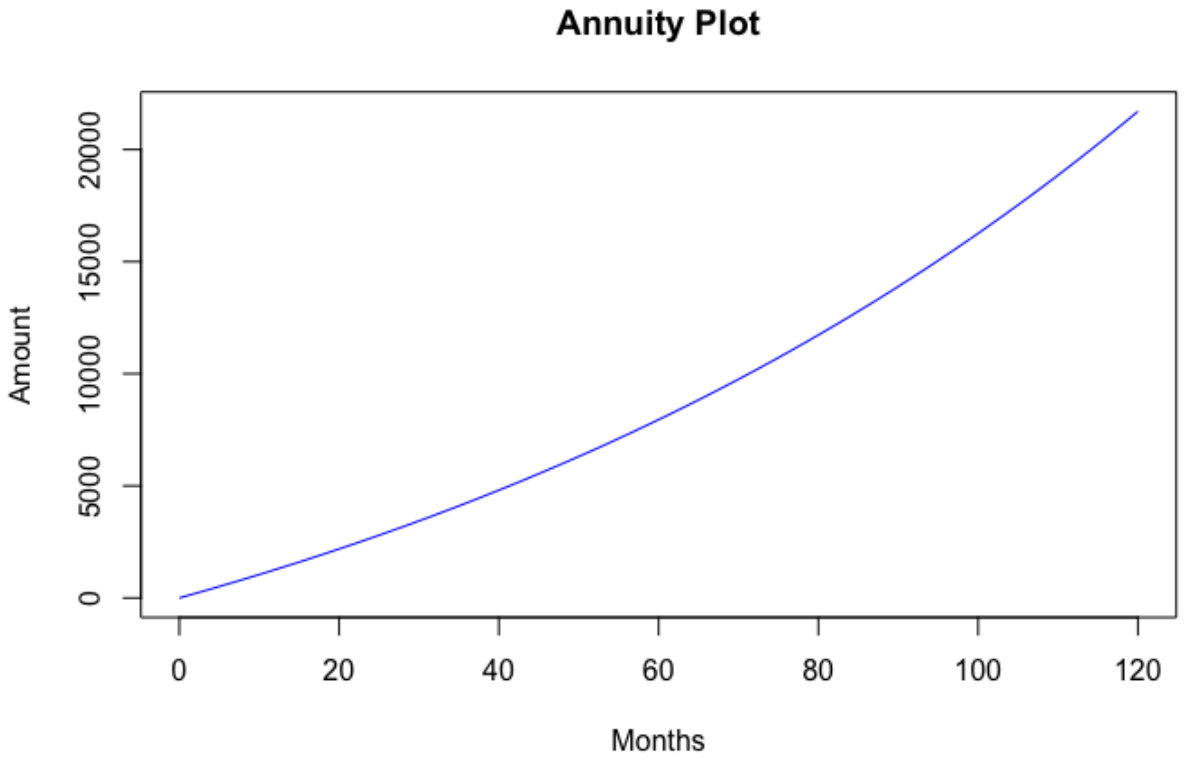
```
> annuity(100,0.12,10,10)
[1] 2630.426
```



```
> annuity(1000,0.06,100,20)
[1] 49514.29
```



```
> annuity(0,0.11,100,10)
[1] 21699.81
```



```
> annuity(10000,0.01,10,3)
[1] 10669.72
```