

Andy & Aaron's tales – Part 5

This week Aaron and Andy need to introduce the project to their class and Aaron asked Andy to prepare some samples. Was it a good idea?

Write only with black or blue pen, things written with pencil will not be considered. Read the exercises carefully. Show your work and circle your answer.

Exercise 1 (6 pt): This is the first data they found about a population of ants that lives in Andy's house:

DAY	ANTS
4	63
7	81.9
10	106.47

Andy: "I don't understand... how can we use those numbers? They don't make any sense..."

Aaron: "You are almost an engineer... you should be familiar with numbers!!!"

Andy: "You should know that I am able only to work with money..."

Aaron: "Yes... you wrote the book 'how to become cheap in 10 days!'"

Find if the data follows a linear or an exponential model.

Exercise 1 (7pt): (Home mortgage) Andy needs a loan of \$100,000 (he hopes to marry his girlfriend even if it's kind of hard for her to resist...). Find how much he should pay if he accepts this offer:

- 30-years fixed rate at 6.5% with closing costs of \$1,500 and 4 points.

$(PMT = [P(APR/n)] / [1 - (1 + APR/n)^{-nY}])$

Exercise 3 (9 pt): Andy: “Nooooooooooooo”

Aaron: “What??? Are you crazy???”

Andy: “Tell me that is not true... the problem is on doubling time... it's too hard for a human mind!!”

Aaron: “You are always able to surprise me... always!”

Problem:

Suppose a quantity Q grows exponentially at a rate of 18% per decade.

(a) Compute the approximate doubling time in years.

(b) Compute the exact doubling time in years.

(c) What percentage of the exact doubling time is the approximate doubling time?

(d) Suppose that you want to work with the approximate doubling time you found. What would be the growth rate?

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