Answer on question 36441 – Math – Algebra

XYZ company purchased a new machine at £50,000 and is using the profits to pay it off. Profits in March were £7876. If profits increase by 2% from previous month in what month will the machine be completely paid off?

I know there is a simple calculation method in order to calculate exponential growth however don't know how to apply to this question.

Solution

Suppose the first payment for the machine was in March. Using the formula of compound interest we get

$$A = A_0(1 + r)^x$$

Where A_0 is the first payment which equals £7876; r=0.02; A is the full cost of machine and x is the number of months which are needed to pay off the machine. Substituting these into the formula we get

$$50000 = 7876 * 1.02^x$$

$$1.02^x \approx 6.3484$$

$$x \approx \log_{1.02} 6.3484 \approx 93.3312$$

Thus the company needs 94 months to pay of the machine. It is equal to 7 years and 10 months. Therefrom the machine will be completely off in December.

Answer: December.