MATH 1090-9: QUIZ 9[1]

November 29, 2007

no calculators allowed!

(Leave your solution in the form which could be entered into your calculator to obtain a numerical answer.)

1. An investor plans to invest $500 at the end of each month into an account earning 6% (annually) compounded monthly. After how many months will the account be worth $50,000$?

Solution. We must solve the following equation for n:

$$50000 = 500\frac{(1 + 0.06/12)^n - 1)}{0.06/12}.$$

So

$$100 = \frac{(1.005)^n - 1}{0.005}$$

and hence

$$1.5 = 1.005^n.$$

Taking ln of both sides leads to

$$n = \frac{\ln(1.5)}{\ln(1.005)}$$

which turns out to be 81.3 months.

2. An investor makes an initial depsoit of $25000 into an account earning 8% (annually) compounded quarterly. How much is the account worth after 5 years?

Solution. We have

$$S = 25000(1 + \frac{0.08}{4})^{4 \cdot 5}$$
$$= 25000(1.02)^{20}$$

which turns out to be 34148.69.

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[1]Useful formulae:

$$S = P(1 + i)^n \qquad S = R\frac{(1 + i)^n - 1}{i} \qquad S_{\text{due}} = R\frac{(1 + i)^n - 1}{i}(i + i).$$