hw solutions
Section 5.3

13. $A = Pe^{rt}$

$r = .06$, $t = 3$, $A = \$20{,}000$

find P.

$20{,}000 = Pe^{(.06)(3)}$

$P = \$16{,}705.40$

23. $A = P\left(1+\frac{r}{m}\right)^{mt}$

$P = 2000$, $A = 4000$, $r = .09$, $m = 12$; find t

$4000 = 2000\left(1+\frac{.09}{12}\right)^{12t}$

$2 = (1.0075)^{12t}$

$\ln 2 = 12t\ln(1.0075)$

$t = \frac{\ln 2}{12\ln(1.0075)} = 7.73$

32. $A = P\left(1+\frac{r}{m}\right)^{mt}$

$t = 5$, $r = .08$, $m = 4$, $A = 22{,}289.22$

find P.

$22{,}289.22 = P\left(1+\frac{.08}{4}\right)^{4\cdot 5}$

$P = 15000.01$

40. Investment A: 10% return compounded semiannually

Investment B: 9.75% return compounded continuously

which has a higher rate of return over a 4-yr period?

A: $A = P\left(1+\frac{.10}{2}\right)^{2(4)} = P(1.05)^8 = P \cdot 1.477455444$

So, investment A gives a 47.7% return over 4-yrs

B: $A = Pe^{rt}$

$e^{rt} = e^{(.0975)(4)} = e^{.39} = 1.476980794$

So investment B gives a 47.698% return over 4-yrs

Investment A has a higher return.

50. find the nominal interest rate that when compounded monthly gives $r_{eff} = 10\%/yr$

$r_{eff} = \left(1+\frac{r}{m}\right)^m - 1$

$.1 = \left(1+\frac{r}{12}\right)^{12} - 1$

$1.1 = \left(1+\frac{r}{12}\right)^{12}$

$(1.1)^{1/12} - 1 = \frac{r}{12}$

$12(1.1)^{1/12} - 12 = r$

So $r = .0956896851$

need a nominal interest rate of 9.57%