Converting Returns:

Effective rates, APR's and

Continuously Compounded rates

Question 1: A stock was bought for $10 and sold one month later for $10.50.

a) What is the effective **monthly** rate of return?

$$V_0 = \frac{V_t}{(1 + r_{eff})^t}$$

b) What is the **APR** compounding per **month**?

$r_{APR,comp\ monthly} =$

c) What is the effective **annual** rate of return?

$r_{eff,annual} =$

d) What is the continuously compounded **monthly** rate of return?

$r_{cc,monthly} =$

e) What is the continuously compounded **annual** rate of return?

$r_{cc,annual} =$

Question 2: A credit card advertises an interest rate of 24%.
Note that credit cards are paid monthly so the interest rate is quoted as an Annualised Percentage Rate (APR) compounding per month.

a) Find the effective monthly rate.

$r_{eff,monthly} =$

b) Find the effective annual rate.

$r_{eff,annual} =$

c) Find the effective 6 month rate.

$r_{eff,6mth} =$

d) Find the effective quarterly rate.

$r_{eff,qtrly} =$

e) Find the Annualised Percentage Rate (APR), compounding every 6 months ($r_{APR,comp\ per\ 6mths}$).

$r_{APR,comp\ per\ 6mths} =$

f) Find the APR compounding per day ($r_{APR,comp\ daily}$). Assume 30 days in a month and 360 days in a year.

$r_{APR,comp\ daily} =$

g) Find the continuously compounded rate per year ($r_{cc\ annual}$). Assume 30 days in a month and 360 days in a year.

h) Find the continuously compounded rate per month ($r_{cc\ monthly}$). Assume 30 days in a month and 360 days in a year.

i) Find the continuously compounded rate per day ($r_{cc\ daily}$). Assume 30 days in a month and 360 days in a year.

Question 3: A bond is advertised with a coupon rate of 7%, paid semi-annually. The yield of the bond is 6%.

Note that the bond pays semi-annual coupons so the yield is quoted as an Annualised Percentage Rate (APR) compounding every 6 months.

a) Find the effective six-month rate.

$r_{eff,6mth} =$

b) Find the effective annual rate.

$r_{eff,annual} =$

c) Find the effective monthly rate.

$r_{eff,monthly} =$

d) Find the effective quarterly rate.

$r_{eff,qtrly} =$

e) Find the Annualised Percentage Rate (APR), compounding every week. Assume 52 weeks per year. ($r_{APR,comp\ weekly}$).

$r_{APR,comp\ weekly} =$

f) Find the APR compounding per day. Assume 30 days in a month and 360 days in a year.

$r_{APR,comp\ daily} =$

g) Find the continuously compounded rate per year ($r_{cc\ annual}$). Assume 30 days in a month and 360 days in a year.

h) Find the continuously compounded rate per month ($r_{cc\ monthly}$). Assume 30 days in a month and 360 days in a year.

i) Find the continuously compounded rate per day ($r_{cc\ daily}$). Assume 30 days in a month and 360 days in a year.