Q1. How much are you effectively earning with an APR (annual percentage rate) of 20% with quarterly compounding?

- Answer: (20%/4+1)^4-1= 21.55%

Q2. You borrow 5,000 3-year loan at 5% from a bank. You are using the amortization schedule of Fixed Payment Schedule, what is your amortization scheme? What is the scheme if this is a 4-year loan?

C$=5000x0.05/(1-1/1.05^3) = 1836.043$

| Year | Beg. Balance | Periodic Payment | Interest Paid | Principal Paid | End. Balance |
|---|---|---|---|---|---|
| Year 1 | 5000 | 1836 | 250 | 1586.043 | 3413.957 |
| Year 2 | 3413.957 | 1836 | 171 | 1665.345 | 1748.612 |
| Year 3 | 1748.612 | 1836 | 87.4 | 1748.612 | 0 |

Q3. You borrow 5,000 3-year loan at 5% from a bank. You are using the amortization schedule of Fixed Principal Schedule, what is your interest payment at the end of second year?

Answer: (5000 – 5000/3) x 0.05=166.67

| Year | Beg. Balance | Periodic Payment | Interest Paid | Principal Paid | End. Balance |
|------|--------------|------------------|---------------|----------------|--------------|
| Year 1 | 5000 | 1916.67 | 250 | 1666.67 | 3333.33 |
| Year 2 | 3333.33 | 1833.34 | 166.67 | 1666.67 | 1666.67 |
| Year 3 | 1666.67 | 1750 | 83.33 | 1666.67 | 0 |

# Q4 and Q5 solutions

Q4. How much are you effectively earning with an APR (annual percentage rate) of 20% with continuously compounding?

Answer: $e^{0.2} - 1 = 0.2214$

Q5. An investment offers a 15% total return over the coming year. You think the total real return on this investment will be only 9%. What do you believe the inflation rate will be over the next year?

Answer: The fisher equation which shows the exact relationship between nominal interest rates and real interest rates and inflation is: (1+ Nominal) = (1+real)(1+inflation)

Inflation rate $= \left[\dfrac{1+0.15}{1+0.09}\right] - 1 = 0.055 \; or \; 5.5\%$