FINA 1082 –Financial Management
Introduction to Business Finance and Introduction to Financial Mathematics
Tutorial Solutions for Lecture 1

Note that detailed answers to tutorial questions will only be provided in tutorials. The following abridged answers are intended as a guide to these detailed answers. This policy is in place to ensure that you attend your tutorial regularly and receive timely feedback from your tutor. If you are unsure of your answers you should check with your tutor, a pit stop tutor or the lecturer.

A. Short Answer Questions
A1. See definition in text and lecture notes.
A2. See definition in text and lecture notes.

B. Multiple Choice Questions
B1. C is correct. We need the future value of a lump sum amount at the end of year 5 which is $66,911.28.
B2. D is correct. We need the future value of an annuity at the end of 7 years which is $33,575.35.
B3. D is correct. We need the unknown interest rate used to value this perpetual cash flow which is 10%.
B4. C is correct. Since the cash flows are received at the beginning of each year we have an annuity due whose present value is $73,460.24.
B5. B is correct. The effective interest rate is given and we need to compute the stated interest rate using the effective interest rate relationship, which is 8.0%.

C. Problems
C1. The present value of each alternative is as follows.
Alternative 2: Since the $1,850 is paid at the end of every year this is an ordinary annuity. Because the cash flows are annual and interest is computed on a monthly basis we first need to compute the effective annual interest rate and then use this rate to obtain the present value of the annual annuity, which is $9,702.98.
Alternative 3: Here we need the monthly interest rate to get the present value of the monthly annuity as $9,885.22.
Alternative 4: Here we need to use the effective interest rate to get the future value of $21,000 at the end of 8 years as $9,467.24.

C2.
a) Amount borrowed = $160,000. Monthly payment = $1,342.71.
b) Interest paid in month 1 = $1,200. Principal repaid in month 1 = $142.71. Principal balance at the end of month 1 = $158,857.29.
See your tutorial notes for the loan's amortization schedule for the first 4 months.
(i) The total amount owed at the end of month 4 = $159,422.69. **(ii)**The total interest paid in month 2 = $1,198.93. **(iii)**The total principal repaid in month 3 = $144.86.
c) The loan amount outstanding is equal to the present value of the remaining payments and is $132,382.36.
d) re = 9.38%.

C3. **a.** r = 10%, t = 5 years

PV (100) = 100/(1+r)^^{t} = 100/(1.1)^5 = 62.09

Answer = £62.09

b. r = 6%, t = 6 years

PV (100) = 100/(1+r)^^{t} = 100/(1.06)^6 = 70.50

Answer = £70.50

c. r = 9%, t = 15 years

PV (100) = 100/(1+r)^^{t} = 100/(1.09)^15 = 27.45

Answer = £27.45

C4. FV = £5000

t = 5

r = 8%

PV = 5000/(1+r)^^{t} = 5000/(1.08)^5 = 3402.92

Answer = £3408.92

C5. r = 5%

t = 8

PV = 3000

Simple interest = 5% x 3000 = 150 p.a.

Cumulative simple interest = 150 x t = 150 x 8 = 1200

Accumulated sum (simple) = 1200 + 3000 = £4200

Compound interest

Accumulated sum (compound)= 3000 x (1+r)^^{t} = 3000 x (1+.05)^8 = £4432

C6. FV = PV x (1+r)^^{t}

FV/PV = (1+r)^^{t}

(FV/PV)^(1/t) = 1+r

(FV/PV)^(1/t) -1 = r

PV	Years	FV	FV/PV	(FV/PV)^(1/t)	**r**
£100	3	£109.27	1.0927	1.03	**3%**
£250	10	£447.71	1.79084	1.06	**6%**
£630.17	6	£1000	1.5869	1.08	**8%**

C7. 1+EAR = (1+ APR/t)^^{t}

(1 + EAR)^(1/t) = 1+APR/t

(1 + EAR)^(1/t) - 1 = APR/t

t x((1 + EAR)^(1/t) - 1) = APR

t = # of compounding periods in 1 year

Effective annualCompounding period APR
Interest rate

16.075%	1 month	12 x ((1.16075)^(1/12) – 1)= 15%
10.38%	3 months	4 x ((1.1038)^(1/4) – 1) = 10%
8.16%	6 months	2 x ((1.0816)^(1/2) – 1) = 8%

C8. PV annuity = C(1/r - 1/r(1+r)^^{t})

a. PV = 1500 + PV annuity

APR = 6%, r = 6%/12 = 0.5%

PV annuity = 250 x (1/(.005) - 1/(.005 x (1+.005)^36)

= 250 x (200 – 167.13)

= 8217.5

Maximum purchase price = 8217.5 + 1500 = £9717.5

b. PV = 1500 + PV annuity

APR = 12%, r = 12%/12 =1%

PV annuity = 250 x (1/(.01) - 1/(.01 x (1+.01)^60)

= 250 x (100 – 55.045)

= 11238.75

Maximum purchase price = 11238.75 + 1500 = £12738.75