HEC Paris **Financial Economics – Fall 2018** **Quiz 1a**

LAST NAME _____ FIRST NAME _____

$A(C,r,g,n) = \frac{C}{r-g}\left(1 - \left(\frac{1+g}{1+r}\right)^n\right)$ $EAR = \left(1 + \frac{r_a}{k}\right)^k - 1$

a) A bank account pays an annual rate (APR or r_a) of 6%. The frequency of compounding is k=4. What is the effective annual rate?

- ❑ 6%
- ❑ 6.09%
- ❑ 6.136% ←
- ❑ 6.168%
- ❑ 6.235%

b) Which cash flow stream has the highest future value at T=2? The interest/discount rate is strictly positive.

	CF_0	CF_1	CF_2
A	80	80	80
B	90	70	80
C	90	80	70
D	90	75	75

- ❑ Cash flow stream A
- ❑ Cash flow stream B
- ❑ Cash flow stream C ←
- ❑ Cash flow stream D
- ❑ All have the same future value

c) You want to invest money in a bank account. Banks A, B and C all offer accounts with the same APR (r_a) of 12%, but different compounding frequencies. Bank A compounds monthly, Bank B compounds quarterly, and Bank C compounds semi-annually. Which account offer do you prefer?

- ❑ Bank A ←
- ❑ Bank B
- ❑ Bank C
- ❑ I am indifferent between the three offers

d) After a successful career, you plan to make a donation to HEC. The donation is used to endow a research chair (i.e., a position for a professor) with a salary of €100,000 per year forever, paid in full at the end of each year. To finance the chair, HEC will invest the money into a savings account that offers an annual return of 10% forever. How much money do you need to donate to HEC?

- ❑ €100,000
- ❑ €500,000
- ❑ €1,000,000 ←
- ❑ €2,000,000
- ❑ No finite amount is enough to finance the research chair forever

e) What is the present value of a growing annuity that starts paying €100 at T=0 (today) and with a last payment made at T=9? The growth rate of cash flows equals 10% (meaning that the cash flow at T=1 equals €110 etc.). The discount rate is 5%.

- ❑ -€11.31
- ❑ €1,089.32
- ❑ €1,138.87
- ❑ €1,243.90 ←
- ❑ €1,368.41

HEC Paris **Financial Economics – Fall 2018** **Quiz 1b**

LAST NAME _____ FIRST NAME _____

$A(C,r,g,n) = \frac{C}{r-g}\left(1 - \left(\frac{1+g}{1+r}\right)^n\right)$ $EAR = \left(1 + \frac{r_a}{k}\right)^k - 1$

a) A bank account pays an annual rate (APR or r_a) of 6%. The frequency of compounding is k=12. What is the effective annual rate?

- ❑ 6%
- ❑ 6.09%
- ❑ 6.136%
- ❑ 6.168% ←
- ❑ 6.235%

b) Which cash flow stream has the highest future value at T=2? The interest/discount rate is strictly positive.

	CF_0	CF_1	CF_2
A	80	80	80
B	90	70	80
C	90	75	75
D	90	80	70

- ❑ Cash flow stream A
- ❑ Cash flow stream B
- ❑ Cash flow stream C
- ❑ Cash flow stream D ←
- ❑ All have the same future value

c) You want to borrow money from a bank. Banks A, B and C all offer loans with the same APR (r_a) of 12%, but different compounding frequencies. Bank A compounds monthly, Bank B compounds quarterly, and Bank C compounds semi-annually. Which loan offer do you prefer?

- ❑ Bank A
- ❑ Bank B
- ❑ Bank C ←
- ❑ I am indifferent between the three offers

d) After a successful career, you plan to make a donation to HEC. The donation is used to endow a research chair (i.e., a position for a professor) with a salary of €100,000 per year forever, paid in full at the end of each year. To finance the chair, HEC will invest the money into a savings account that offers an annual return of 5% forever. How much money do you need to donate to HEC?

- ❑ €100,000
- ❑ €500,000
- ❑ €1,000,000
- ❑ €2,000,000 ←
- ❑ No finite amount is enough to finance the research chair forever

e) What is the present value of a growing annuity that starts paying €100 at T=0 (today) and with a last payment made at T=9? The growth rate of cash flows equals 8% (meaning that the cash flow at T=1 equals €108 etc.). The discount rate is 5%.

- ❑ -€11.31
- ❑ €1,089.32
- ❑ €1,138.87 ←
- ❑ €1,243.90
- ❑ €1,368.41

HEC Paris **Financial Economics – Fall 2018** **Quiz 1c**

LAST NAME _____ FIRST NAME _____

$A(C,r,g,n) = \frac{C}{r-g}\left(1 - \left(\frac{1+g}{1+r}\right)^n\right)$ $EAR = \left(1 + \frac{r_a}{k}\right)^k - 1$

a) A bank account pays an annual rate (APR or r_a) of 6%. The frequency of compounding is k=2. What is the effective annual rate?

- ❑ 6%
- ❑ 6.09% ←
- ❑ 6.136%
- ❑ 6.168%
- ❑ 6.235%

b) Which cash flow stream has the highest future value at T=2? The interest/discount rate is strictly positive.

	CF_0	CF_1	CF_2
A	90	80	70
B	90	70	80
C	80	80	80
D	90	75	75

- ❑ Cash flow stream A ←
- ❑ Cash flow stream B
- ❑ Cash flow stream C
- ❑ Cash flow stream D
- ❑ All have the same future value

c) You want to invest money in a bank account. Banks A, B and C all offer accounts with the same APR (r_a) of 12%, but different compounding frequencies. Bank A compounds semi-annually, Bank B compounds monthly, and Bank C compounds quarterly. Which account offer do you prefer?

- ❑ Bank A
- ❑ Bank B ←
- ❑ Bank C
- ❑ I am indifferent between the three offers

d) After a successful career, you plan to make a donation to HEC. The donation is used to endow a research chair (i.e., a position for a professor) with a salary of €75,000 per year forever, paid in full at the end of each year. To finance the chair, HEC will invest the money into a savings account that offers an annual return of 15% forever. How much money do you need to donate to HEC?

- ❑ €100,000
- ❑ €500,000 ←
- ❑ €1,000,000
- ❑ €2,000,000
- ❑ No finite amount is enough to finance the research chair forever

e) What is the present value of a growing annuity that starts paying €100 at T=0 (today) and with a last payment made at T=9? The growth rate of cash flows equals 10% (meaning that the cash flow at T=1 equals €110 etc.). The discount rate is 3%.

- ❑ -€11.31
- ❑ €1,089.32
- ❑ €1,138.87
- ❑ €1,243.90
- ❑ €1,368.41 ←

HEC Paris **Financial Economics – Fall 2018** **Quiz 1d**

LAST NAME _____ FIRST NAME _____

$A(C,r,g,n) = \frac{C}{r-g}\left(1 - \left(\frac{1+g}{1+r}\right)^n\right)$ $EAR = \left(1 + \frac{r_a}{k}\right)^k - 1$

a) A bank account pays an annual rate (APR or r_a) of 6%. The frequency of compounding is k=12. What is the effective annual rate?

- ❑ 6%
- ❑ 6.09%
- ❑ 6.136%
- ❑ 6.168% ←
- ❑ 6.235%

b) Which cash flow stream has the highest future value at T=2? The interest/discount rate is strictly positive.

	CF_0	CF_1	CF_2
A	80	80	80
B	90	80	70
C	90	75	75
D	90	70	80

- ❑ Cash flow stream A
- ❑ Cash flow stream B ←
- ❑ Cash flow stream C
- ❑ Cash flow stream D
- ❑ All have the same future value

c) You want to borrow money from a bank. Banks A, B and C all offer loans with the same APR (r_a) of 12%, but different compounding frequencies. Bank A compounds semi-annually, Bank B compounds monthly, and Bank C compounds quarterly. Which loan offer do you prefer?

- ❑ Bank A ←
- ❑ Bank B
- ❑ Bank C
- ❑ I am indifferent between the three offers

d) After a successful career, you plan to make a donation to HEC. The donation is used to endow a research chair (i.e., a position for a professor) with a salary of €120,000 per year forever, paid in full at the end of each year. To finance the chair, HEC will invest the money into a savings account that offers an annual return of 12% forever. How much money do you need to donate to HEC?

- ❑ €100,000
- ❑ €500,000
- ❑ €1,000,000 ←
- ❑ €2,000,000
- ❑ No finite amount is enough to finance the research chair forever

e) What is the present value of a growing annuity that starts paying €100 at T=0 (today) and with a last payment made at T=9? The growth rate of cash flows equals 8% (meaning that the cash flow at T=1 equals €108 etc.). The discount rate is 6%.

- ❑ -€11.31
- ❑ €1,089.32 ←
- ❑ €1,138.87
- ❑ €1,243.90
- ❑ €1,368.41