# 1.4 Financial apps\_compound interest\_depreciation\_P\_1

**1a.** *[3 marks]*

## Markscheme

N = 24  
I % = 14  
PV = −14000  
FV = 0  
P/Y = 4  
C/Y = 4          ***(M1)(A1)***

**Note:** Award ***M1***for an attempt to use a financial app in their technology, award ***A1***for all entries correct. Accept PV = 14000.

(€)871.82        ***A1***

***[3 marks]***

**1b.** *[2 marks]*

## Markscheme

4 × 6 × 871.82          ***(M1)***

(€) 20923.68          ***A1***

***[2 marks]***

**1c.** *[2 marks]*

## Markscheme

20923.68 − 14000        ***(M1)***

(€) 6923.68         ***A1***

***[2 marks]***

**1d.** *[2 marks]*

## Markscheme

0.9 × 14000 (= 14000 − 0.10 × 14000)      ***M1***

(€) 12600.00      ***A1***

***[2 marks]***

**1e.** *[3 marks]*

## Markscheme

N = 72

PV = 12600

PMT = −250

FV = 0

P/Y = 12

C/Y = 12       ***(M1)(A1)***

**Note:** Award ***M1*** for an attempt to use a financial app in their technology, award ***A1***for all entries correct. Accept PV = −12600 provided PMT = 250.

12.56(%)            ***A1***

***[3 marks]***

**1f.** *[2 marks]*

## Markscheme

***EITHER***

Bryan should choose Option A       ***A1***

no deposit is required       ***R1***

**Note:** Award ***R1*** for stating that no deposit is required. Award ***A1***for the correct choice from that fact. Do not award ***R0A1***.

***OR***

Bryan should choose Option B        ***A1***

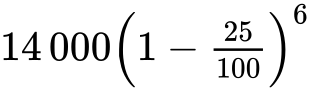
cost of Option A (6923.69) > cost of Option B (72 × 250 − 12600 = 5400)        ***R1***

**Note:** Award ***R1***for a correct comparison of costs. Award ***A1*** for the correct choice from that comparison. Do not award ***R0A1***.

***[2 marks]***

**1g.** *[3 marks]*

## Markscheme

       ***(M1)(A1)***

**Note:** Award ***M1***for substitution into compound interest formula.  
Award ***A1***for correct substitutions.

= (€)2491.70      ***A1***

***OR***

N = 6

I% = −25

PV = ±14 000

P/Y = 1

C/Y = 1       ***(A1)(M1)***

**Note:** Award ***A1***for PV = ±14 000, ***M1***for other entries correct.

(€)2491.70       ***A1***

***[3 marks]***

**2a.** *[3 marks]*

## Markscheme

N = 24  
I % = 14  
PV = −14000  
FV = 0  
P/Y = 4  
C/Y = 4          ***(M1)(A1)***

**Note:** Award ***M1***for an attempt to use a financial app in their technology, award ***A1***for all entries correct. Accept PV = 14000.

(€)871.82        ***A1***

***[3 marks]***

**2b.** *[2 marks]*

## Markscheme

4 × 6 × 871.82          ***(M1)***

(€) 20923.68          ***A1***

***[2 marks]***

**2c.** *[2 marks]*

## Markscheme

20923.68 − 14000        ***(M1)***

(€) 6923.68         ***A1***

***[2 marks]***

**2d.** *[2 marks]*

## Markscheme

0.9 × 14000 (= 14000 − 0.10 × 14000)      ***M1***

(€) 12600.00      ***A1***

***[2 marks]***

**2e.** *[3 marks]*

## Markscheme

N = 72

PV = 12600

PMT = −250

FV = 0

P/Y = 12

C/Y = 12       ***(M1)(A1)***

**Note:** Award ***M1*** for an attempt to use a financial app in their technology, award ***A1***for all entries correct. Accept PV = −12600 provided PMT = 250.

12.56(%)            ***A1***

***[3 marks]***

**2f.** *[2 marks]*

## Markscheme

***EITHER***

Bryan should choose Option A       ***A1***

no deposit is required       ***R1***

**Note:** Award ***R1*** for stating that no deposit is required. Award ***A1***for the correct choice from that fact. Do not award ***R0A1***.

***OR***

Bryan should choose Option B        ***A1***

cost of Option A (6923.69) > cost of Option B (72 × 250 − 12600 = 5400)        ***R1***

**Note:** Award ***R1***for a correct comparison of costs. Award ***A1*** for the correct choice from that comparison. Do not award ***R0A1***.

***[2 marks]***

**2g.** *[4 marks]*

## Markscheme

real interest rate is 0.4 − 0.1 = 0.3%         ***(M1)***

value of other payments 250 + 250 × 1.003 + … + 250 × 1.003

use of sum of geometric sequence formula or financial app on a GDC        ***(M1)***

= 20 058.43

value of deposit at the end of 6 years

1400 × (1.003) = 1736.98       ***(A1)***

Total value is (€) 21 795.41       ***A1***

**Note:** Both ***M*** marks can awarded for a correct use of the GDC’s financial app:

N = 72 (6 × 12)  
I % = 3.6 (0.3 × 12)  
PV = 0  
PMT = −250  
FV =  
P/Y = 12  
C/Y = 12

***OR***

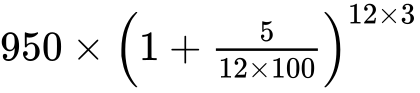
N = 72 (6 × 12)  
I % = 0.3  
PV = 0  
PMT = −250  
FV =  
P/Y = 1  
C/Y = 1

***[4 marks]***

**3a.** *[3 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

    ***(M1)(A1)***

**Note:** Award ***(M1)*** for substitution in the compound interest formula: ***(A1)*** for correct substitution.

**OR**

N = 3  
I% = 5  
PV = 950  
P/Y = 1  
C/Y = 12    ***(A1)(M1)***

**Note:** Award ***(A1)*** for C/Y = 12 seen, ***(M1)*** for other correct entries.

**OR**

N = 36  
I% = 5  
PV = 950  
P/Y = 12  
C/Y = 12    ***(A1)(M1)***

**Note:** Award ***(A1)*** for C/Y = 12 seen, ***(M1)*** for other correct entries.

1103.40 (EUR)    ***(A1)(G3)***

**Note:** Answer must be given to 2 decimal places.

***[3 marks]***

**3b.** *[3 marks]*

## Markscheme

(20 × 3 + 1100) − 1103.40    ***(M1)(M1)***

**Note:** Award ***(M1)*** for correct substitution into cost of bike function, ***(M1)*** for subtracting their answer to part (a). This subtraction may be implied by their final answer (follow through from their part (a) for this implied subtraction).

55.60 (EUR)    ***(A1)*(ft)*(G3)***

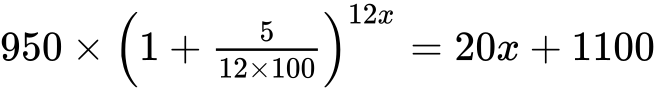
**Note:** Follow through from part (a). The answer must be two decimal places.

***[3 marks]***

**3c.** *[5 marks]*

## Markscheme

**METHOD 1**

     ***(M1)(M1)***

**Note:** Award ***(M1)*** for their correct substitution in the compound interest formula with a variable in the exponent; ***(M1)*** for comparing their expressions provided variables are the same (not an expression with  for years and another with  representing months). Award at most ***(M0)(M1)(A0)(M1)(A0)*** for substitution of an integer in both expressions and comparison of the results. Accept inequality.

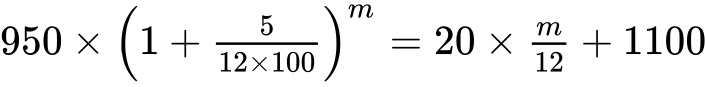
( =) 4.52157… (years)    ***(A1)*(ft)**

4.52157… × 12 (= 54.2588…)     ***(M1)***

**Note:** Award ***(M1)*** for multiplying **their** value for  by 12. This may be implied.

 = 55 (months)    ***(A1)*(ft)*(G4)***

**METHOD 2**

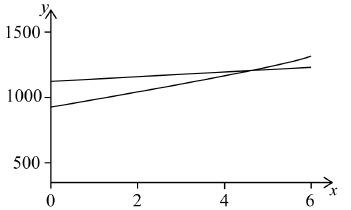
     ***(M1)(M1)(M1)***

**Note:** Award ***(M1)*** for their correct substitution in the compound interest formula with a variable in the exponent to solve; **(M1)** for comparing their expressions provided variables are the same; ***(M1)*** for converting years to months in these expressions. Award at most ***(M0)(M1)(A0)(M1)(A0)*** for substitution of an integer in both expressions and comparison of the results. Accept inequality.

 = 54.2588… (months)    ***(A1)*(ft)**

 = 55 (months)    ***(A1)*(ft)*(G4)***

***METHOD 3***

***(M1)(M1)***

**Note:** Award ***(M1)*** for each graph drawn.

( =) 4.52157… (years)    ***(A1)*(ft)**

4.52157… × 12 (= 54.2588…)     ***(M1)***

**Note:** Award ***(M1)*** for multiplying **their** value for  by 12. This may be implied.

      If the graphs drawn are in terms of months, leading to a value of 54.2588…, award ***(M1)(M1)(M1)(A1)***, consistent with METHOD 2.

 = 55 (months)    ***(A1)*(ft)*(G4)***

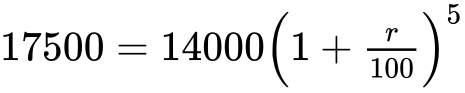
**Note:** Follow through for a compound interest formula consistent with their part (a). The final ***(A1)*(ft)** can only be awarded for correct answer, or their correct answer following through from previous parts and only if value is rounded up. For example, do not award ***(M0)(M0)(A0)(M1)(A1)*(ft)** for an unsupported “5 years × 12 = 60” or similar.

***[5 marks]***

**4a.** *[3 marks]*

## Markscheme

\* This question is from an exam for a previous syllabus, and may contain minor differences in marking or structure.

     ***(M1)(A1)***

**Note:** Award ***(M1)*** for substitution into the compound interest formula, ***(A1)*** for correct substitution. Award at most ***(M1)(A0)*** if not equated to 17500.

OR

*N* = 5

*PV* = ±14000

*FV* = 17500

*P*/*Y* = 1

*C*/*Y* = 1     ***(A1)(M1)***

**Note:** Award ***(A1)*** for *C*/*Y* = 1 seen, ***(M1)*** for **all** other correct entries. *FV* and *PV* must have opposite signs.

= 4.56 (%)  (4.56395… (%))     ***(A1) (G3)***

***[3 marks]***

**4b.** *[2 marks]*

## Markscheme

14000 × 66.91     ***(M1)***

**Note:** Award ***(M1)*** for multiplying 14000 by 66.91.

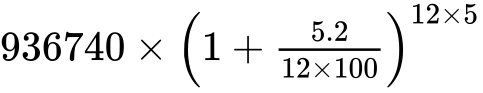
936740 (INR)     ***(A1) (G2)***

**Note:** Answer must be given to the nearest whole number.

***[2 marks]***

**4c.** *[3 marks]*

## Markscheme

     ***(M1)(A1)*(ft)**

**Note:** Award ***(M1)*** for substitution into the compound interest formula, ***(A1)*(ft)** for their correct substitution.

**OR**

*N* = 60

*I*% = 5.2

*PV* = ±936740

*P*/*Y*= 12

*C*/*Y*= 12    ***(A1)(M1)***

**Note:** Award ***(A1)*** for *C*/*Y*= 12 seen, ***(M1)*** for **all** other correct entries.

**OR**

*N* = 5

*I*% = 5.2

*PV* = ±936740

*P*/*Y*= 1

*C*/*Y*= 12    ***(A1)(M1)***

**Note:** Award ***(A1)*** for *C*/*Y*= 12 seen, ***(M1)*** for **all** other correct entries

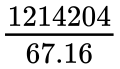
= 1214204 (INR)     ***(A1)*(ft) *(G3)***

**Note:** Follow through from part (b). Answer must be given to the nearest whole number.

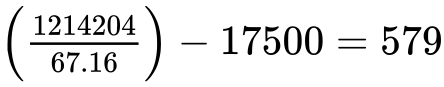
***[3 marks]***

**4d.** *[3 marks]*

## Markscheme

     ***(M1)***

**Note:** Award ***(M1)*** for dividing their (c) by 67.16.

 (USD)     ***(M1)(A1)*(ft) *(G3)***

**Note:** Award ***(M1)*** for finding the difference between their conversion and 17500. Answer must be given to the nearest whole number. Follow through from part (c).

***[3 marks]***

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