# 1.7 Loan repayment and amortization\_P\_11

**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***

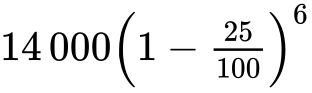
cost of Option A (6923.69) > cost of Option B (72 × 250 − 12600 = 5400)        ***R1***

**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

evidence of using Finance solver on GDC      ***M1***

         ***A1***

It will take 40 months         ***A1***

***[3 marks]***

**3b.** *[2 marks]*

## Markscheme

       ***M1A1***

***[2 marks]***

**3c.** *[2 marks]*

## Markscheme

Monthly payment = 315.70)      ***M1A1***

***[2 marks]***

**3d.** *[2 marks]*

## Markscheme

     ***M1A1***

***[2 marks]***

**3e.** *[1 mark]*

## Markscheme

The monthly repayment is lower, he might not be able to afford $316 per month.   ***R1***

***[1 mark]***

**3f.** *[1 mark]*

## Markscheme

the total amount to repay is lower.     ***R1***

***[1 mark]***

**4a.** *[2 marks]*

## Markscheme

evidence of using Finance solver on GDC      ***M1***

Monthly payment = 784.60)          ***A1***

***[2 marks]***

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

## Markscheme

     ***M1A1***

***[2 marks]***

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

## Markscheme

    ***M1A1***

It will take 181 months   ***A1***

***[3 marks]***

**4d.** *[2 marks]*

## Markscheme

   ***M1A1***

***[2 marks]***

**4e.** *[1 mark]*

## Markscheme

The monthly repayment is lower, she might not be able to afford $1000 per month.   ***R1***

***[1 mark]***

**4f.** *[1 mark]*

## Markscheme

the total amount to repay is lower.   ***R1***

***[1 mark]***

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

## Markscheme

74300) ***M1A1***

***[2 marks]***

**4h.** *[2 marks]*

## Markscheme

Use of finance solver with *N* =120, *PV* = $74400*, I* = 7%      ***A1***

854 − $856)      ***A1***

***[2 marks]***

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