

# Chapter 5 Financial Maths

## Section 5.4 Loans – Mortgages

### PROJECT MATHS Text & Tests 6

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Amortisation

$$A = P \frac{i(1+i)^t}{(1+i)^t - 1}$$

#### Example 1

Calculate the size of the monthly repayments needed for a car loan of €10 000 if the loan is to be repaid over a 5-year term at an effective monthly rate of 0.72%.

$P$  Loan = 10,000  
 $A$  Repayment = ?  
 $i = 0.72\%$  MER  
 $t = 5(12) = 60$

$$A = \frac{10000 (0.0072) (1.0072^{60})}{(1.0072^{60}) - 1}$$

$$= \text{€ } 205.84$$

### Example 2

Find the monthly repayments required for a mortgage of €150 000, based on an annual rate of 4.5% over 20 years.

$$A = \frac{P i (1+i)^t}{(1+i)^t - 1}$$

$$A = ?$$

$$P = 150,000$$

$$t = 20(12) = 240 \text{ months}$$

$$\text{MER} = ?$$

$$\text{AER} = 4.5\%$$

need MER.

$$\text{MER}, r = \sqrt[12]{1+i} - 1$$

$$r = \sqrt[12]{1.045} - 1$$

$$r = 0.00367 \quad (0.367\%)$$

Repayments, A

$$A = \frac{150,000 (0.00367) (1.00367)^{240}}{1.00367^{240} - 1}$$

$$= €941.22$$