Chapter 5 Financial Maths

Section 5.2 Depreciation

$$F = P(1-i)^t$$

PROJECT MATHS
Text & Tests 6

Depreciation: $F = P(1 - i)^t$	F = future value i = the percentage depreciation of €P per year t = number of years P = initial value

Example 1

A company buys a new machine priced at €35 000.
The machine depreciates by 20% on a reducing balance basis each year.

(i) What will the value of the machine be in 4 years time?
(ii) By how much has the machine depreciated in value during this time?

$$F = P(1-i)^t = 35{,}000\,(0.8)^4$$
$$= 14{,}336$$

$$\text{Depreciation} = 35000 - 14336 = 20664$$

Example 2

A garage has a petrol stock of 100 000 litres.
If the manager estimates (a) that he will sell 4000 litres a day
                          (b) that he will sell 5% of his stock per day,
calculate the difference in his estimates after 20 days.

a)   4000 litres per day
      × 20 days
      ──────────────
   =   80 000 litres used

STRAIGHT LINE
DEPRECIATION

b) $F = P(1-i)^t$ = $100\ 000\ (1 - 0.05)^{20}$

REDUCING BALANCE
DEPRECIATION

   = $100000 (0.95)^{20}$

   = 35,848·6 litres used

DIFFERENCE = 80,000 − 35,848·6 = 4,415·4 litres

---

5. A company asset reduces in value from €175 000 to €73 187.09, at a depreciation rate of
    16% per annum over t years.
    ~~(i) By trial and error, estimate the value of t.~~
    (ii) Using logs, find the value of t.

$F = P(1-i)^t$

$t = \log_{(1-i)}\left(\frac{F}{P}\right)$

$F = 73187·09$
$P = 175000$
$i = 16\%$
$t = ?$

$t = \log_{0·84}\dfrac{73187·09}{175000} \approx 5\ years$