

P = present value (start)

F = future value = amount (end)

t = time

c = interest = decimal

$$F = P(1+c)^t$$

$$P = \frac{F}{(1+c)^t}$$

£300 is invested for 4 years at 2% AER. Find value at end of fourth year.

AER = annual equivalent rate (save)

APR = annual percentage rate (borrow)

$$t = 4 \quad c = 0.02 \quad P = 300.$$

$$F = P(1+c)^t \\ = 300(1.02)^4$$

$$= €324.73$$

I can pay a loan back in 2 years time. The interest rate is 8% APR. I will pay back €3215.14. How much can I borrow?

$$t = 2 \quad i = 0.08 \quad F = 3215.14$$

$$P = \frac{F}{(1+i)^t} = \frac{3215.14}{(1.08)^2} = €2756.46$$

€2000 was invested at $r\%$ for 2 years compound interest.

A tax of 25% was deducted each year from the interest gained.

At the end of the first year the investment amounted to €2030, after tax was deducted.

- (i) Calculate the rate of interest $r\%$.
- (ii) Find the amount of the investment at the end of 2 years, after tax has been deducted.

Year by year

$$\text{Year 1: } P = 2000 \quad r = r \quad \text{Tax } 25\%$$

$$75\% = 30$$

$$1\% = \frac{30}{25}$$

$$100\% = \frac{30}{25} \times \frac{100}{1} = 40$$

$$F = 2040$$

$$F = P(1+r)$$

$$\frac{2040}{2000} = 1+r$$

$$1+r = 1.02$$

$$r = 0.02$$

$$r = 2\%$$

Year 2:

$$2030(1.02)$$

$$= €2070.60$$

Gain 40.60

Tax 40.60(0.25)

Left 40.60(0.25) = 30.45

Ans €2060.45