Section 5.2
Present Value

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MATHS 103: Mathematics for Business I

Recall: (Section 4.1) The compound interest formula is given by

$$A = P\left(1 + \frac{r}{m}\right)^{nm}$$

To find the present value P alone, we get

$$A = P\left(1 + \frac{r}{m}\right)^{mn}$$

$$\frac{A}{\left(1 + \frac{r}{m}\right)^{mn}} = P$$

$$A\left(1 + \frac{r}{m}\right)^{-mn} = P$$

Hence, the present value is given by

$$P = A\left(1 + \frac{r}{m}\right)^{-mn}$$

Example

Find the present value of

1. 350 BD due in seven years at 5% compounded semi–annually:

$$P = A\left(1+\frac{r}{m}\right)^{-nm} = 350\left(1+\frac{0.05}{2}\right)^{-2\cdot 7} = 247.7\text{BD}$$

2. 600 BD due in 5.5 years at 3% compounded quarterly:

$$P = A\left(1+\frac{r}{m}\right)^{-nm} = 600\left(1+\frac{0.03}{4}\right)^{-4\cdot 5.5} = 509.04\text{BD}$$

Exercise

Find the present value of

1. 120 BD due in 2.5 years at 10% compounded weekly.
2. 200 BD due in 5 years at 5% compounded daily.
3. 300 BD due in 7 years at 20% compounded monthly.
4. 12000 BD due in one year at 5.3% compounded annually.