§5.2 - Present Value

Recall: The compound interest formula

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

A → future value

P → present value.

To find the present value alone, we get

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

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

So the present value formula is

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

Example 1: Find the present value of

(a) 350 BD due in seven years at 5% (Sem.) annually.

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

(b) 600 BD due in 5.5 years at 3% quarterly.

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

Exercise 1: Find the present value of

(a) 120 BD due in 2.5 years at 10% compounded weekly.

(b) 200 BD due in 5 years at 5% compounded daily.

(c) 300 BD due in 7 years at 20% compounded

(d) 12000 BD due in one year at 5.3% annually.