8.5 – Annuities – Present Value

Formula:

$$PV = R \times \left(\frac{1-(1+i)^{-n}}{i}\right)$$

PV: present value

R: regular payments

Example 1: $\int = 2.5\%$ 8.5 – Annuities – Present Value

Mike is done University with a reasonable debt of $35,000. His interest rate with OSAP is prime plus 1%, compounded monthly. How much does he need to pay every month if he wants this paid off in 5 years?

$i = \frac{0.035}{12} = 0.0029$

$n = 12 \times 5 = 60$

$$PV = R \times \left(\frac{1 - (1+i)^{-n}}{i} \right)$$

$$35000 = R \times \left(\frac{1 - (1.0029)^{-60}}{0.0029} \right)$$

$$\frac{35000}{54.997} = R \times \frac{54.997}{54.997}$$

$\$636.40 = R$

Example 2:

Melanie wants to buy a car. She can afford to pay $200 a month for 4 years. She figures that she will get an interest rate no higher than 4%/a compounded monthly.

What car price should she be looking for?

R

$i = \frac{0.04}{12} = 0.0033$

$n = 12 \times 4 = 48$

$$PV = R \times \left(\frac{1 - (1+i)^{-n}}{i} \right)$$

$$PV = 200 \times \left(\frac{1 - (1.0033)^{-48}}{.0033} \right)$$

$$PV = 200 \times 44.324$$

$$PV = \$8,864.80$$