8.4 – Annuities – Future Value

Formula:

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

↳ Regular Payments.

Example 1: R

Mike invests $250 a month into his bank account, which earns 8%/a compounded monthly. If Mike does this for 16 years, how much will he have in his bank account and how much interest did he earn?

$i = \frac{0.08}{12} = 0.0066$

$n = 16 \times 12 = 192$

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

$$FV = 250 \times \left(\frac{(1.0066)^{192} - 1}{0.0066} \right)$$

$FV = 250 \times 384.264$

$FV = \$96,066.02$

$FV = R's + |Interest|$

Mike gave $250 \times 192 = \$48,000$

Interest = 96,066.02 − 48,000

48,066.02

8.4 – Annuities – Future Value

Example 2:

Melanie is about to start high school and she wants $20 000 in her bank account when she graduates. If she can earn 5% compounded quarterly, how much money does she need to put in her bank account every 3 months?

FV

$i = \frac{0.05}{4} = 0.0125$

3 months = quarterly

$n = 4 \times 4 = 16$

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

$$20000 = R \times \left(\frac{(1.0125)^{16} - 1}{0.0125} \right)$$

$$\frac{20000}{17.59116} = R \times \frac{17.59116}{17.59116}$$

$\$1\,136.93 = R$