Name: Solutions

/16

PC 11

Finance QUIZ

When using the TVM Solver, write down clearly all of your entries in the right order:

N :
I :
PV :
PMT :
FV :
P/Y :
C/Y :

1. Describe when you use which method in the following table: [1]

Simple interest formula	when it says SIMPLE interest and no regular payment is made
Compound interest formula	when it doesn't say SIMPLE interest and no regular payment is made.
TVM solver	when the interest is compounded and regular payments are made

2. If Sophie is investing $1500 with a 6.5% simple interest rate, how much is her investment worth after 15 years? [1]

$A = 1500(1 + 0.065 \times 15)$ $\boxed{A = \$2962.50}$

3. Is it better to invest money with simple interest or compound interest for the same given rate? [1]

Compound Interest : money grows faster.

4. If Alex is investing $2500 with an 8% interest rate, compounded quarterly, how much is his investment worth after 10 years? [1]

$A = 2500\left(1 + \frac{0.08}{4}\right)^{4\times 10}$ $\boxed{A = \$5520.10}$

5. You are investing $12 000. The interest rate is 3.6%.
a) How long will it take for the value of your investment to double if it's a simple interest? [2]

$24000 = 12000(1 + 0.036t)$

$2 = 1 + 0.036t$

$1 = 0.036t$

$t = \frac{1}{0.036} \approx 27.\overline{7}$

$\Rightarrow$ 27 years and 9 months

b) How long will it take for the value of your investment to double if the interest is compounded monthly? [2]

$24000 = 12000\left(1 + \frac{0.036}{12}\right)^{12t}$

$2 = 1.003^{12t}$

1.003^{135} is the closest

135 months

OR

11 years and 3 months

6. Charlie invested $23 000 5 years ago with an interest rate compounded semi-annually. His investment is now worth $31 000. What is the interest rate that the bank is using? [2]

$31\,000 = 23000\left(1+\frac{r}{2}\right)^{10}$ $\quad \sqrt[10]{\frac{31}{23}} = 1+\frac{r}{2}$

$\frac{31}{23} = \left(1+\frac{r}{2}\right)^{10}$ $\quad r = 2\left(\sqrt[10]{\frac{31}{23}} - 1\right)$ $\Rightarrow$ **6%**

$r \simeq 0.06$

7. How much money should you invest today if you want to have $10 000 in 3 years? The bank is proposing 3.2% interest compounded quarterly. [1]

$10\,000 = P\left(1+\frac{0.032}{4}\right)^{12}$

$P = \frac{10000}{1.008^{12}}$ $\quad$ **$P \simeq \$9088.11$**

8. a) If you invest $350 every month in a savings account with 4% interest rate, compounded quarterly for 8 years, how much money will you have? [2]

N = 12x8 = 96
I = 4
PV = 0
PMT = −350
FV = ?
P/Y = 12
C/Y = 4

$\Rightarrow$ **$39 499.71**

b) How much interest did you gain? [1]

$39\,499.71 - 350 \times 96 =$ **$5899.71**

9. How long does it take to receive $50 000 by making regular $1000 payments 4 times a year at 5% interest rate compounded semi-annually? [2]

N = ? ≈ 39.13 (or 9.75 years or 117 months)
I = 5
PV = 0
PMT = −1000
FV = 50 000
P/Y = 4
C/Y = 2

$\Rightarrow$ 9 years and 9 months.