# FINANCE 1: QUIZ SOLUTIONS

**Question 1**

If $A = P(1 \pm i)^n$, then $n = \dfrac{\log A + \log P}{\log(1 \pm i)}$.

A. True B. False

**Solution**

$$A = P(1 \pm i)^n$$

$$\therefore (1 \pm i)^n = \frac{A}{P}$$

$$\therefore \log(1 \pm i)^n = \log \frac{A}{P}$$

$$\therefore n\log(1 \pm i) = \log A - \log P$$

$$\therefore n = \frac{\log A - \log P}{\log(1 \pm i)}$$

So, the correct answer is B.

**Question 2**

If $A = P(1 + i)^n$ and $A$ = 75 000, $P$ = 58 000 and $i$ = 9,6%, what is the value of $n$?

A. 0,38 B. 2,8 C. 30,9 D. 53,3

**Solution**

2. If $A = 75\,000, \quad P = 58\,000, \quad i = 0,096, \quad n = ?$

$$\therefore 75\,000 = 58\,000(1 + 0,096)^n$$

$$\therefore (1,096)^n = \frac{75\,000}{58\,000} = \frac{75}{58}$$

$$\therefore n\log 1,096 = \log 75 - \log 58$$

$$\therefore n = \frac{\log 75 - \log 58}{\log 1,096} = 2,8041$$

So, the correct answer is B.

**Question 3**

Adam invested R72 500 at 8,9% interest compounded quarterly. After how long will his investment be worth R101 000?

A. 15 years 6 months B. 15 years 1 month C. 3 years 9 months
D. 3 years 8 months

**Solution**

$$A = 101\,000, \quad P = 72\,500, \quad i = \frac{0,089}{4}, \quad n = ?$$

$$\therefore 101\,000 = 72\,500\left(1 + \frac{0,089}{4}\right)^{4n}$$

$$\therefore \left(1 + \frac{0,089}{4}\right)^{4n} = \frac{101\,000}{72\,500} = \frac{1010}{725}$$

$$\therefore 4n = \frac{\log 1010 - \log 725}{\log\left(1 + \frac{0,089}{4}\right)} = 15,06556 \text{ quarters}$$

$$= 3,766 \text{ years}$$

$$= 3 \text{ years } 9 \text{ months}$$

So, the correct answer is C.

**Question 4**

It is estimated that there are 20 000 fish in a lake. A conservationist calculates that they are decreasing in number by 13% each year. How long will it be before there are only 1 000 fish left in the lake?

A. 21 years 5 months B. 21 years 6 months C. 25 years 5 months
D. 24 years 6 months.

**Solution**

$$A = P(1-i)^n, \quad P = 20\,000, \quad A = 1\,000, \quad i = 0,13 \quad n = ?$$

$$\therefore 1\,000 = 20\,000(1 - 0,13)^n$$

$$\therefore (0,87)^n = \frac{1\,000}{20\,000} = \frac{1}{20} = 0,05$$

$$\therefore n \log 0,87 = \log 0,05$$

$$\therefore n = \frac{\log 0,05}{\log 0,87} = 21,51147 \text{ years}$$

$$= 21 \text{ years } 6 \text{ months}$$

So, the correct answer is B.

**Question 5**

A woman invests R100 000 in a new digital printing business. If her business grows at 10% pa, how long will it take her to grow her business to R500 000?

A. 15 years B. 16 years C. 17 years D. 18 years

**Solution**

$$P = 100\,000, \quad A = 500\,000, \quad i = 0{,}1, \quad n = ?$$

$$\therefore 500\,000 = 100\,000(1 + 0{,}1)^n$$

$$\therefore (1{,}1)^n = \frac{500\,000}{100\,000} = 5$$

$$\therefore n \log 1{,}1 = \log 5$$

$$\therefore n = \frac{\log 5}{\log 1{,}1} = 16{,}88 \text{ years}$$

$$= 17 \text{ years}$$

So, the correct answer is C.