FINANCE, GROWTH AND DECAY

2026 WORKSHEET

June 2025

QUESTION 7

7.1 John invests an amount of money in an account paying interest at a rate of 15% p.a., compounded monthly. Calculate the annual effective interest rate of this investment. (2)

7.2 Tino invests R500 000 in an account earning interest at the rate of 6% p.a., compounded quarterly. Tino decides to withdraw R11 250 at the end of every 3 months. Tino will continue making these regular withdrawals until there is no money in the account. How many withdrawals of R11 250 will Tino be able to make? (5)

7.3 On **1 March 2021**, Abby made a once-off deposit of R12 000 into an account earning interest at a rate of 9,5% p.a., compounded monthly. She deposited R500 into the same account on **1 April 2023** and continues to make these monthly deposits of R500 on the first day of each month thereafter.

Calculate how much money was in the account immediately after the deposit of R500 is made on **1 March 2025**, exactly four full years after her initial deposit. (6)

[13]

November 2024

QUESTION 7

7.1 Mary's grandparents deposited R5 000 into a savings account on the day that she was born. The account pays interest at a rate of 6,8% p.a., compounded quarterly. Calculate the accumulated amount in this account on Mary's 16th birthday. (3)

7.2 After 4 years, the value of a printer was half of its original value. Determine the rate at which the value of the printer depreciated over this period, if depreciation was calculated according to a straight-line method. (2)

7.3 Tshepo was granted a loan of R100 000 on 1 March 2022 at an interest rate of 13,5% p.a., compounded monthly. Tshepo agreed to repay the loan over 5 years in monthly instalments of R2 300,98, starting on 1 April 2022.

7.3.1 Calculate the total interest that he will pay over the 5 years. (2)

7.3.2 Tshepo paid R22 300,98 (his monthly instalment and an additional R20 000) on 1 March 2024 into the loan account. He continues to pay the original monthly instalment thereafter. How many months earlier will Tshepo repay the loan? (7)

[14]

FINANCE, GROWTH AND DECAY

2026 WORKSHEET SOLUTIONS

June 2025

QUESTION/*VRAAG* 7

7.1

$$(1+i)=\left(1+\frac{15}{1200}\right)^{12}$$

$$i=16{,}08\%$$

7.2

$$P=\frac{x\left[1-(1+i)^{-n}\right]}{i}$$

$$500\,000=\frac{11\,250\left[1-\left(1+\frac{0{,}06}{4}\right)^{-n}\right]}{\frac{0{,}06}{4}}$$

$$\frac{2}{3}=1-\left(1+\frac{0{,}06}{4}\right)^{-n}$$

$$(1{,}015)^{-n}=\frac{1}{3}$$

$$-n=\log_{1{,}015}\left(\frac{1}{3}\right)$$

$n=73{,}788\ldots$

$\therefore n=73$ withdrawals

7.3

$$A=P(1+i)^n$$

$$=12\,000\left(1+\frac{0{,}095}{12}\right)^{12\times4}$$

$$=\text{R }17\,521{,}17895\ldots$$

$$F=\frac{x[(1+i)^n-1]}{i}$$

$$F=\frac{500\left[\left(1+\frac{0{,}095}{12}\right)^{24}-1\right]}{\frac{0{,}095}{12}}$$

$$=\text{R }13\,158{,}64744\ldots$$

Total $=17\,521{,}17895\ldots+13\,158{,}64744\ldots$

$=\text{R}30\,679{,}83$

November 2024

QUESTION/*VRAAG* 7

7.1	$A = P(1+i)^n$ $A = 5\,000\left(1+\frac{6,8}{400}\right)^{64}$ $= \text{R}14\,706,56$
7.2	$A = P(1-in)$ $\frac{1}{2}P = P(1-4i)$ $\frac{1}{2} = (1-4i)$ $i = \frac{1}{8}$ $\therefore r = 12,5\%$ **OR/*OF*** $r = \frac{50\%}{4}$ $r = 12,5\%$
7.3.1	Already paid: $2\,300,98 \times 60 = \text{R}138\,058,80$ Interest: $138\,058,80 - 100\,000 = \text{R}\,38\,058,80$

7.3.2

Balance after 2 years:

$$P = \frac{x\left[1-(1+i)^{-n}\right]}{i}$$

$$P = \frac{2\,300{,}98\left[1-\left(1+\frac{13{,}5}{1200}\right)^{-36}\right]}{\frac{13{,}5}{1200}}$$

$= \text{R } 67\,804{,}94$

R 67 804,94 – R20 000 = R 47 804,94

$$P = \frac{x\left[1-(1+i)^{-n}\right]}{i}$$

$$47\,804{,}94 = \frac{2\,300{,}98\left[1-\left(1+\frac{13{,}5}{1200}\right)^{-n}\right]}{\frac{13{,}5}{1200}}$$

$0{,}766 = (1{,}01125)^{-n}$

$\log_{1{,}01125} 0{,}766 = -n$

$n = 23{,}83$

$\therefore$ 12 months earlier

OR/*OF*

$$A = 100\,000\left(1+\frac{13{,}5}{1200}\right)^{12\times 2}$$

$= \text{R}130\,799{,}12$

$$F = \frac{2\,300{,}98\left[\left(1+\frac{13{,}5}{1200}\right)^{12\times 2}-1\right]}{\frac{13{,}5}{1200}}$$

$= \text{R } 62\,993, 92$

Balance outstanding = A – F = 130 799,12 – 62 993,92
= R67 805,20

R 67 805,20 – R20 000 = R 47 805,20

$$P = \frac{x\left[1-(1+i)^{-n}\right]}{i}$$

$$47\,805{,}20 = \frac{2\,300{,}98\left[1-\left(1+\frac{13{,}5}{1200}\right)^{-n}\right]}{\frac{13{,}5}{1200}}$$

$0{,}766\ldots = (1{,}01125)^{-n}$

$\log_{1{,}01125} 0{,}766\ldots = -n$

$n = 23{,}80$

$\therefore$ 12 months' earlier