

## K5: Interest

E.g. you invest R2 000 at a simple interest rate of 12% for 5 years.

How much money do you have at the end of <b>the first year</b> ? $A_1 = 2\,000 + 0,12 \times 2\,000 = R2\,240$	Interest earned is R240
How much money do you have at the end of <b>the second year</b> ? $A_2 = 2\,240 + 0,12 \times 2\,000 = R2\,480$	Interest earned is R240
How much money do you have at the end of <b>the third year</b> ? $A_3 = 2\,480 + 0,12 \times 2\,000 = R2\,720$	Interest earned is R240
How much money do you have at the end of <b>the fourth year</b> ? $A_4 = 2\,720 + 0,12 \times 2\,000 = R2\,960$	Interest earned is R240
How much money do you have at the end of <b>the fifth year</b> ? $A_5 = 2\,960 + 0,12 \times 2\,000 = R3\,200$	Interest earned is R240

### Exercise 1: Simple Interest (Graph)

You invest R3 000 at a simple interest rate of 15% for 4 years

Complete the following table:

How much money do you have at the end of <b>the first year</b> ? $A_1 = 3\,000 + 0,15 \times 3\,000 = R\,3\,450$	Interest earned R450
How much money do you have at the end of <b>the second year</b> ? $A_2 = 3\,450 + 0,15 \times 3\,000 = R\,3\,900$	Interest earned R450
How much money do you have at the end of <b>the third year</b> ? $A_3 = 3\,900 + 0,15 \times 3\,000 = R\,4\,350$	Interest earned R450
How much money do you have at the end of <b>the fourth year</b> ? $A_4 = 4\,350 + 0,15 \times 3\,000 = R\,4\,800$	Interest earned R450

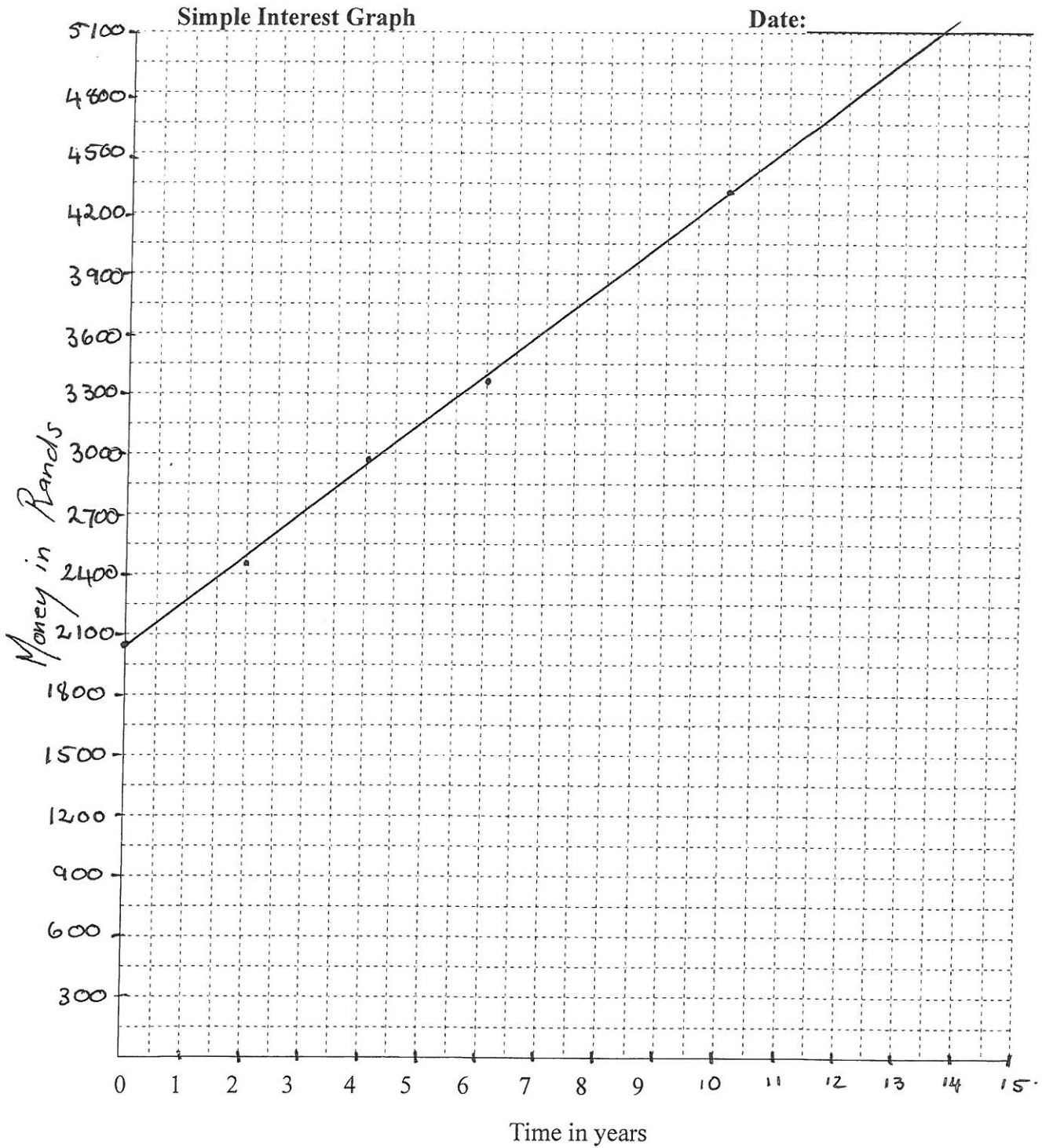
Check your answer with the Formula:  $A = P(1 + in)$

$$A = 3\,000(1 + 0,15 \times 4)$$

$$A = R\,4\,800$$

Draw a graph below to show that simple interest is a linear function  
 You invest R2 000 at a simple interest rate of 12%. (14 years)

Year	0	2	4	6	10	14
Money	R2000	R2480	R2960	R3440	R4400	R5360



## COMPOUND INTEREST

Let us see what will happen if:

You invest R2 000 at a **compound** interest rate of 12% for 5 years

How much money do you have at the end of <b>the 1<sup>st</sup> year</b> ? $A_1 = 2\,000 + 0,12 \times 2\,000 = R2\,240$	Interest earned is R240
How much money do you have at the end of <b>the 2<sup>nd</sup> year</b> ? $A_2 = 2\,240 + 0,12 \times 2\,240 = R2\,508,80$	Interest earned is R268,80
How much money do you have at the end of <b>the 3<sup>rd</sup> year</b> ? $A_3 = 2\,508,80 + 0,12 \times 2\,508,80 = R2\,809,86$	Interest earned is R301,06
How much money do you have at the end of <b>the 4<sup>th</sup> year</b> ? $A_4 = 2\,809,86 + 0,12 \times 2\,809,86 = R3\,147,04$	Interest earned is R337,18
How much money do you have at the end of <b>the 5<sup>th</sup> year</b> ? $A_5 = 3\,147,04 + 0,12 \times 3\,147,04 = R3\,524,68$	Interest earned is R377,64

You invest R3 000 at a compound interest rate of 15% for 5 years.

### Exercise 2: Compound Interest (Graph)

Complete the table below:

How much money do you have at the end of <b>the 1<sup>st</sup> year</b> ? <u><math>R3000 + (0,15 \times 3000) = R3450</math></u>	Interest earned is <u>R 450</u>
How much money do you have at the end of <b>the 2<sup>nd</sup> year</b> ? <u><math>R3450 + (0,15 \times 3450) = R3967,50</math></u>	Interest earned is <u>R 517,50</u>
How much money do you have at the end of <b>the 3<sup>rd</sup> year</b> ? <u><math>R3967,50 + (0,15 \times 3967,50) = R4562,63</math></u>	Interest earned is <u>R 595,13</u>
How much money do you have at the end of <b>the 4<sup>th</sup> year</b> ? <u><math>R4562,63 + (0,15 \times 4562,63) = R5247,02</math></u>	Interest earned is <u>R 684,39</u>
How much money do you have at the end of <b>the 5<sup>th</sup> year</b> ? <u><math>R5247,02 + (0,15 \times 5247,02) = R6034,07</math></u>	Interest earned is <u>R 787,05</u>

$A = P(1 + i)^n$  Check your answer

$$= 3000(1 + 0,15)^5$$

$$= R6034,07$$

Draw a simple and compound interest graph on the same pair of axis below. Discuss differences  
 You invest R2 000 at a compound interest rate of 12% for 16 years.

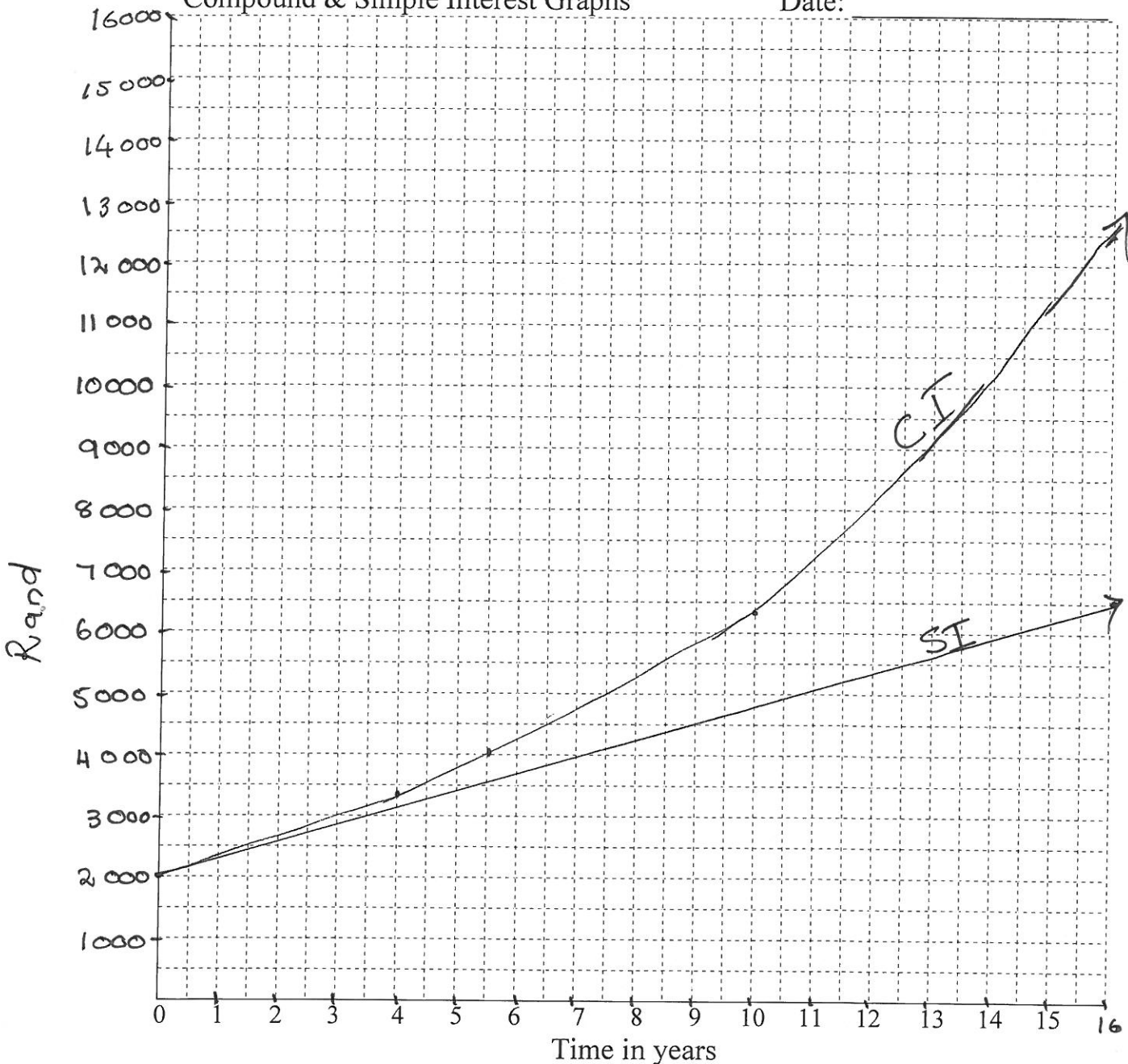
Years	0	2	4	6	10	16
Money (SI)	2 000	2 480	2 960	3 440	4 400	5 840
Money (CI)	2 000	2 508,80	3 147,04	3 947,65	6 211,70	12 260,79

$$A = P(1 + in)$$

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

Compound & Simple Interest Graphs

Date: \_\_\_\_\_



Use the formula to calculate how much money you will have after 40 years. Simple interest and compound interest.  $ER = R 11 600,00$   $SR = R 186 101,94$

Conclusion: The longer the money in the bank, the more compound interest! Grows faster than SI