

## (A) Lesson Objectives

- a. Introduce formulas for working with simple interest
- b. Connect simple interest to arithmetic sequences
- c. Extend skills to include exchange rates & inflation

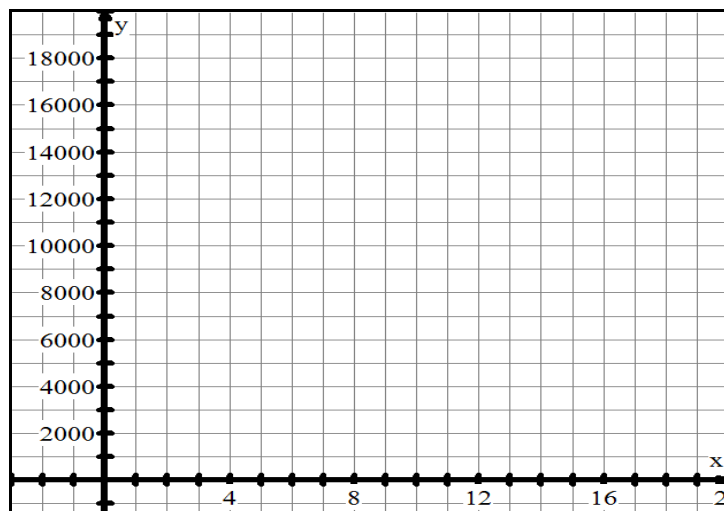
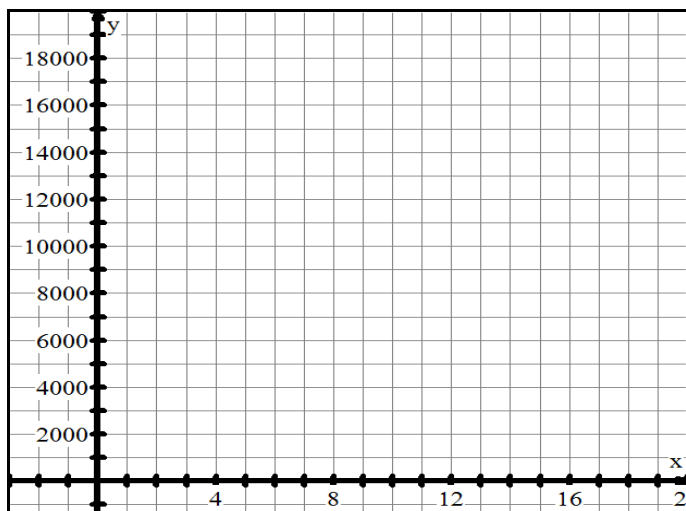
## (B) Opening Problem

Mr. Santowski has a \$10,000 (US\$) education savings plan which earns him a simple interest of 7.5% p.a. Two other details are important in this opening problem → I keep this investment for 18 years and the annual rate of inflation grows exponentially at a rate of 2.25%.

Complete the following table, showing the values of the investment and the interest amounts earned.

	Initial amount	1 year	2 years	3 years	5 years	10 years	15 years
Interest earned per year							
Cumulative amount of interest earned							
Total value of the investment							

- i. Prepare graphs of the data as (i) a continuous function and (ii) as discrete terms of an arithmetic sequence
- ii. Calculate the slope of the linear relation and interpret its meaning in context.



- iii. How did you calculate the amount of annual interest paid?
- iv. Calculate the total amount of interest earned after 18 years.
- v. How did you determine the value of the investment at any given year?
- vi. Write out the first 8 annual values of the investment as terms of an arithmetic sequence.
- vii. Determine the value of  $u_1$  and  $d$  for Q(iv) and explain their significance in the context of the question
- viii. Mr. S. needs to exchange the final value of this investment (after 18 years) into New Zealand dollars as my son wants to study in Auckland, given the exchange rate of 1 NZD = 0.84562 USD.
- ix. What is the REAL effect of the fact that inflation must be taken into account?
- x. What is the REAL VALUE of this investment, given the rate of inflation as 2.25%

### **(C) Basic Skills – Simple Interest**

We can write several different formulas for Simple Interest and for calculating the total interest earned and for calculating the total value of the investment →

### **(D) Concept Connection – Arithmetic Sequences**

**(E) Practice**

Interest Earned	Principle	rate	time	Amount
?	\$2500	3.75 % /a	3 a	?
?	\$1200	4.25 % /a	6 m	?
?	\$3000	3 % /a	?	\$3120
?	\$2000	?	1½ a	\$2210
?	?	4 % /a	2 a	\$4050
?	?	4.25 % /a	175 d	\$1200

**(F) Extension**

Amount Invested	Annual Rate of Simple Interest	Time of Investment	Interest Earned	Total Value of Investment	Convert to Currency
USD 25,000	4.25% p.a.	12 a.			JPY
GBP 8,000	3.5% p.a.	10 a.			INR
CAD 35,000		8 a.		1,220,000 THB	GBP
	6% p.a.		AUD 5,000	SGD 92,000	USD