

Question 12**(10 marks)**

Jessica wants to borrow \$15 000 from her parents to purchase a car. They will be charging her compound interest at the rate of 4% per annum, with interest added yearly.

- (a) Jessica is currently studying so she will not want to be making any regular repayments.
- (i) Complete the table below to show the amount she will owe her parents at the end of each year. (2 marks)

Number of years (n)	0	1	2	3
Amount owing (\$)	15 000			

- (ii) Write a recursive rule to calculate the amount owing at the end of each year. (2 marks)

Jessica's parents are encouraging her to get a part-time job so that she can make repayments along the way. Jessica estimates that she will be able to earn enough money to pay off \$2400 each year.

- (b) If interest is charged yearly and she repays the \$2400 at the end of each year, write a recursive rule to calculate the amount owing at the end of each year. (1 mark)
- (c) If interest is charged monthly and she makes equal monthly repayments,
- (i) write a recursive rule to calculate the amount owing at the end of each month. (1 mark)

(ii) calculate how many months it will take to repay the loan. (1 mark)

(iii) calculate the total amount Jessica would pay over the duration of the loan. (3 marks)