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| --- | --- | --- | --- |
| Name:  Teacher : | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | Date:\_\_\_\_\_\_\_\_\_ |
|  | **Year 12 Essentials – Practical Application 2021**  **Loans and Compound Interest - Mark Scheme**  **Weighting 11% Due Date: \_\_\_\_\_\_\_\_\_\_\_\_** | **Mark \_\_\_\_\_\_\_\_\_** | |

Scenario

Danielle would like to buy a second-hand car that costs $15 995.

She has had $3000 in a term deposit for the last 2 years earning 1.4% p.a. interest compounded quarterly and he been saving 10% of her salary every month for the last 6 months which has been put into a savings account earning 0.45%p.a. interest compounded monthly.

Danielle can use this money for a deposit, but she will need to borrow the remaining amount.

She has a steady income and takes home $3200 a month.

Can Danielle afford a new car?

|  |  |
| --- | --- |
| Description / Working | Marks /42 |
| **Interpret the task and gather the key information**   * Some Introduction * Rewrites the question to be answered   **Identifies Information required**   * Amount from the term deposit * Amount from savings * Research a loan for the car * Research possible loan options for the car | 1  1  1  1  1  1  /6 |
| **Identify the mathematics which could help to complete the task**   * Using compound interest to find the term deposit amount * Using compound interest to find the savings amount * Finding the repayment on a loan * Can the repayments be made on the salary? | 1  1  1  1  /4 |
| **Analyse information and apply their existing mathematical knowledge and strategies to obtain a solution**  Term Deposit  Savings   |  |  |  |  | | --- | --- | --- | --- | | Time  (Months) | Start Amount | Interest | Final Amount | | 1 | $320 |  | $320.12 | | 2 | $320.12+320=$640.12 |  | $640.36 | | 3 | $640.12+320=960.36 |  | 960.72 | | 4 | 960.72+320=1280.72 | 0.48 | 1281.20 | | 5 | 1281.20+320=1601.20 |  | 1601.80 | | 6 | 1601.80+320=1921.80 |  | $1922.52 |   Total deposit 1 922.52+3 085.04=$5 007.56  Needs to borrow 15 995-5 007.56 = $10 987.44  Car Loan   * Identify loan amount parameters for one loan * Calculate monthly repayment value   Second loan with changed conditions   * Different interest rate or time period * Monthly payment value | 1 (compound interest formula)  1 (correct values for variables)  1(correct answer)  1 ($340 start amount)  1 (Correct interest Formula)  1 (Final amount first Month)  5(Correct for each month)  1  1 (accept rounded values)  2  2  1  2  /20 |
| **Verify the reasonableness of the solution**   * Answers correctly rounded to 2 decimal places for money * Identifies other costs involved with owning a car * Calculates other costs * Calculates monthly cost for a car * Identifies other bills/costs that will need to be considered – How much of his salary could he use? | 2  1  1  2  2  /8 |
| **Communicate findings in a systematic and concise manner**   * Conclusion * Answers the original question * Report set out logically * Reference section included | 1  1  1  1  /4 |