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| Mathematics Department | |  |
| Course: A1MAA | |
| Topic Title: Applications of Rates & Percentages, Matrices & Matrix Arithmetic  Test 2 | |
| Student Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date: \_\_\_\_\_\_\_\_\_\_\_\_ | | |
| Special Instructions: **Calculator Free** | Time Allowed: 30 minutes | | |
| Formula Sheet Allowed | Marks: / 32 | | |
|  | | | |

**Question 1 (2, 2 : 4 marks)**

If , , and , then find the values of:

a) b)

**Question 2 (2 marks)**

Using the formula v = u + at, calculate v given: u =16, a =0.5 and t = 15

(b) Tyler’s usual rate of pay is $24.

What will he be paid per hour when he is paid *time-and-a-half?* (1 mark)

(c) Beth works 40 hours in a normal week and is paid $35.00 per hour.

How much will she in earn in one week? (1 mark)

(e) Fran sold 5000 tickets to a concert and earned $15 000 in commission. What was the commission on each ticket? (1 mark)

**Question 12 (8 marks)**

The table below shows part of a spreadsheet Ann uses to calculate her employees’ weekly pay. In this spreadsheet

* + - The rows are numbered 1 to 5 and the columns labelled A to G.
    - The symbols used to represent mathematical operations are

+ (add), - (subtract), \* (multiply), / (divide) and ^ (to the power of)

* + - The order of operations can be controlled by brackets.

Tax is paid on the income minus deductions.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** | **F** | **G** |
| **1** | **Person** | **Number of hours worked** | **Hourly rate** | **Income** | **Total deductions** | **Percentage tax (%)** | **Take-home pay** |
| **2** | Jim | 38 | $21.00 |  | $50.00 | 9.05 |  |
| **3** | Jen | 25 | $24.00 |  | $25.00 | 9.49 |  |
| **4** | Tony | 40 | $25.60 |  | 0 | 11.0 |  |
| **5** | Tina | 32 | $23.50 |  | $25.00 | 12.5 |  |

(a) Describe the data stored in cell B4. (1 mark)

(b) In which cell is Jim’s hourly rate? (1 mark)

(c) To calculate the values to store in D3 the formula used is D3=B3\*C3.

What value will be stored in D3? (1 mark)

(d) Who paid the lowest rate of tax? (1 mark)

(e) Write a formula using the cell references, e.g., B5, C5 etc.. to determine the amount of tax that Tina should pay. (2 marks)

(f) Calculate Tony’s take-home pay. (2 marks)

Below is a portion of the spreadsheet of the above loan. It shows the interest per month and the amount at the end of each month for the final 12 months of the investment.

|  |  |  |  |
| --- | --- | --- | --- |
| Month | Amount at  start of  month | Monthly  Interest | Amount at  end of  month |
| 25 | 9693.57 | 48.47 | 9742.04 |
| 26 | 9742.04 | 48.71 | 9790.75 |
| 27 | 9790.75 | 48.95 | 9839.71 |
| 28 | 9839.71 | 49.20 | 9888.90 |
| 29 | 9888.90 | 49.44 | 9938.35 |
| 30 | 9938.35 | 49.69 | 9988.04 |
| 31 | 9988.04 | 49.94 | 10037.98 |
| 32 | 10037.98 | 50.19 | 10088.17 |
| 33 | 10088.17 | 50.44 | 10138.61 |
| 34 | 10138.61 | 50.69 | 10189.30 |
| 35 | 10189.30 | 50.95 | 10240.25 |
| 36 | 10240.25 | 51.20 | 10291.45 |

ii) **Show** how:

1. The monthly interest of $48.47 has been calculated for month 25
2. The amount at the end of month 25 has been determined

iii) How much interest is earned at the end of the 3 years?