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| Mathematics Department | |  |
| Course: A1MAA | |
| **Topic Title:** Test 2 - Algebra, Earning Money & Simple/Compound Interest | |
| Student Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Date: \_\_\_\_\_\_\_\_\_\_\_\_ | | |
| Special Instructions: **Calculator Allowed** | Time Allowed: 65 minutes | | |
| Formulae Sheet and 1 A4 page of notes allowed. | Marks: / 65 | | |
| Show all working. | | | |

**Question 1 [1, 1, 1: 3 marks]**

To estimate blood alcohol content (*BAC*) two formulae are provided; one for males (*BAC m*) and one for

females (*BAC f* ).

**  AND **

where *n* is the number of standard drinks consumed, *h* is the number of hours since drinking alcohol and *m* is

the person’s mass in kilograms.

Bradley is 65 kg. He has had four standard drinks and it is three hours since his last drink.

(a) Show the substitution required to estimate Bradley’s *BAC*.

(b) Use your substitution from part (a)(i) to estimate Bradley’s *BAC.*

(c) If the legal blood alcohol limit is 0.05 for full license holders operating motor vehicles, would

Bradley pass OR fail the test?

**Question 2 [2, 2, 3: 7 marks]**

1. For a loan of $100 000, interest is charged at an annual rate of 4.8% using a simple interest

calculation. If the loan is taken out over 7 years, how much interest would be charged?

(b) How much interest would be charged on a loan of $100 000, if interest is charged at an annual rate

of 4.8% compounding annually over 7 years?

(c) Calculate the interest charged on a loan of $100 000 if interest is charged at a rate of 4.8% pa

compounded quarterly over 7 years?

**Question 3 [2: 2 marks]**

When Tahlia received the annual report for her share portfolio, she noticed that the estimate for her

percentage dividend was 8.2%. For a portfolio worth $543 820, how much was her dividend estimate?

**Question 4 [4: 4 marks]**

Toys R’US that has 12.5million shares make an after tax profit of $28.7 million. Of their annual profit the

directors decide to pay a dividend of 28% of the total profit. Calculate the dividend paid per share.

**Question 5 [4: 4 marks]**

The table below shows the declared dividends of three companies.

|  |  |  |
| --- | --- | --- |
| **Company** | **Share Price** | **Dividend** |
| ROG Ltd | $ 6.40 | 71 c |
| DFV | $ 8.85 | 93 c |
| Gordon & Sons | $ 7.10 | 85 c |

Compare the dividend yields of three companies to determine the best yielding stocks.

**Question 6 [1, 1, 1, 1, 1, 2: 7 marks]**

The table below the next sheet shows part of a spreadsheet John Deer uses to calculate his employees’

weekly pay. In this spreadsheet

* The rows are numbered 1 to 6 and the columns labelled A to F.
* 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** |  | |  |
| **1** | **Employee** | **Number of hours worked** | **Hourly rate** | **Weekly Income** | **Deductions** | **Take-home pay** | |
| **2** | Jim | 38 |  | $ 712.50 | $50 |  | |
| **3** | Jen | 25 | $24.00 |  | $42 |  | |
| **4** | Tony | 40 | $25.60 |  | $63 |  | |
| **5** | Pam | 35 |  | $1050 | $65  **TOTAL** |  | |

**6**

(a) Describe the data stored in cell B4.

(b) i. In which cell is Jim’s hourly rate?

ii. Calculate his hourly rate

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

i. What value will be stored in D3?

ii. Complete cell D4

(d) Complete the values for the rest of the table; write a formula to compute the value for F6.

**Question 7 [1, 1, 3: 5 marks]**

If Tina earns an annual salary of $54 600:

(a) What would her weekly salary be?

(b) Given that she works 35 hours per week, what would her hourly rate be?

(c) If Tina receives the following allowances,

* + - Height Allowance set at $5.50 per hour
    - Meal Allowance set at $16.50 per day
    - Site Allowance set at $115.30 per week

calculate her weekly wage.

**Question 8 [2, 3, 3: 8 marks]**

A young person qualifies for youth allowance of $272.80 per fortnight, so long as they do not earn more

than $415 before tax in that time.

In any fortnight that they do earn more than $415, their allowance will be reduced by 50 cents in the dollar

for earnings over $415 and up to $498, reduced by 60 cents in the dollar for earnings over $498.

1. Sam has a part-time job for eight hours every Saturday and six hours every Sunday that pays

$22.25 per hour.

1. Calculate her fortnightly earnings.
2. Calculate her fortnightly youth allowance. Justify your answer.
3. Sam has been offered an extra six hours work on a Friday but a friend has told her that she will not qualify for youth allowance if she takes these additional hours. Show that her friend is correct.

**Question 9 [8, 1: 9 marks]**

Rosie receives a student allowance of $430 from the government each fortnight. She also receives a weekly

income of $180 from paid work.

**Rosie’s fixed weekly costs are:**

Rent $100 per week Electricity $180 per quarter

Bus fares $40 per fortnight Food $320 per month

Insurances $450 per annum Entertainment $1300 every 6 months

1. Set up a weekly budget for Rosie using the given data into a table. (rounding to the nearest dollar)

(b) Given there were no other expenses, how much did Rosie save for the week?

**Question 10 [4, 3, 3: 10 marks]**

John wants to see which of the two banks in his portfolio of shares is the better performer, and he

decides to use the P/E ratio to compare the two banks.

 

ANZ Bank’s shares are currently $33.65 while Westpac’s shares are currently $32.055.

ANZ Bank has annual earnings of 207.5 cents per share.

Westpac has annual earnings of 223.1 cents per share.

a) Calculate the P/Eratio for each bank and make a recommendation as to which bank John

should buy more of, if the P/E ratio was the only indicator to be used.

Justify your recommendation.

Dividends from both banks are paid twice a year and in the last year ANZ Bank gave dividends at

82c and 84c per share.

b) What percentage of its annual earnings does ANZ Bank distribute to shareholders?

c) Westpac paid an interim dividend of 66c per share. It has a policy of paying 65% of its annual

earnings as dividends. What would you expect its final dividend payout to be?

**Question 11 [3: 3 marks]**

A real estate salesman is paid commission of 1.2% of the value of all properties sold. He sells two houses, one for $455 000 and another for $762 000. Calculate the total commission the agent will receive.

**Question 12 [3: 3 marks]**

Larry buys 2000 shares at $3.00 a share. If the stockbroker charges a 0.75% brokerage fee, what will be the total cost of Larry’s investment?