MATHEMATICS APPLICATIONS

YEAR 11 - UNIT 1

TEST 1 - 2021

CONSUMER ARITHMETIC

SECTION ONE – CALCULATOR FREE

TIME: 20 mins
MARKS: 21 marks

STUDENT'S NAME: SOLUTIONS

CIRCLE YOUR TEACHER'S NAME:

Mrs Indrawirawan	Mr Riemer	Mr Stillitano
Mr Galbraith	Ms Thompson	Mr Hamilton-Brown

- No calculators are allowed during this section of the test.
- Show all necessary working in order to obtain full marks.
- A formula sheet will be provided.

1. The following spreadsheet shows the budget for the month of July for a family of four:

	A	B	C	D
1	**BUDGET FOR JULY**			
2	**Income**	**Amount**	**Fixed Expenditure**	**Amount**
3	Wages after tax	5490	Home loan	1415
4	Family Benefit	130	Insurance	265
5			Rates	225
6			Car repayment	350
7			Car registration	50
8			Internet service	80
9			Health Insurance	240
10			**Variable Expenditure**	
11			Gas and Electricity	250
12			Food Cost	1500
13			Car running expenses	375
14			Clothing	250
15			**Discretionary Expenditure**	
16			Entertainment	290
17			Eating out	210
18			Gifts	85
19				
20	**Summary**			
21	Net Income	5620		
22	Expenditure Fixed	2625		
23	Variable	2375		
24	Discretionary	585		
25	Surplus per month	35		
26	Surplus per year	420		
27				

a) Write the formula that one would have to enter into:

i. cell B21?

= B3 + B4 ✓

ii. cell B24?

= D16 + D17 + D18 ✓

or = sum(D16 : D18) (-1 if no = sign)

(2)

b) Explain what is meant by Variable Expenditure.

Amount spent on these items may change from month-to-month. ✓

(1)

c) Explain where changes to spending could be made, if the family wanted to save more money. (2)

Cutting down on both Variable + Discretionary spending.
(ie. Use less electricity or Eat out less).

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2. Calculate the fortnightly wage for an annual salary of $104 000.

(1)

$\frac{104\,000}{26} = \$4000 / ft$ ✓

3. Calculate the weekly wage for a person working a 35-hour week at $20/hour.

(1)

$35\,hr \times \$20 = \$700\ p/w$ ✓

4. Micah normally earns $18/hour. If he works one day for five hours at his normal pay rate, and four hours of overtime, at a time-and-a-half rate, how much does he earn for that day?

(2)

$(\$18 \times 5) + (\$18 \times 4 \times 1.5)$ ✓

$= 90 + 108$

$= \$198$ ✓

5. Determine the price of a $12 magazine which is marked-up by 2.5%.

(2)

100 % = $12
10 % = $1.20
5 % = $0.60
2.5 % = $0.30

} or similar ✓

$\$12 + \$0.30 = \$12.30$ ✓

6. Peter buys a mobile phone for $480 and sells it a year later for $120.
Calculate his percentage loss.

(2)

Loss = 480 − 120
= $360

% Loss = $\frac{360}{480} \times 100$ ✓

= 75 % ✓

7. In a department store, a child's bicycle had the marked price of $242.00. Determine the amount of G.S.T. applied to the cost of the bicycle. (Assume G.S.T. is 10%)

(2)

G.S.T. = $\frac{242}{11}$ ✓

= $22 ✓

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8. A $1 400 computer has a constant depreciation rate of 20% p.a. Determine the value of the computer after two years

(2)

$\$1400 \times \frac{80}{100} = \$1120$ (after 1 yr) ✓

$\$1120 \times \frac{80}{100} = \$896$ ✓

9. In the same industry, company A has a P/E ratio of 12 and company B has a P/E ratio of 15. Using these ratios, explain which company may be "better" in the short term, to invest in.

(2)

Company A ✓ as you would only need to spend $12 to earn $1. ✓
(As opposed to $15 with Company B)

OR

Company A ✓ as it would only take 12 yrs for the dividend to pay for the share. ✓
(As opposed to 15 yrs with Company B)

10. Delilah is paid a retainer of $1800 per month, plus a commission of 2% of her total monthly sales. If her total monthly sales are $60 000, calculate her monthly wage.

(2)

Monthly wage $= \$1800 + \left(\frac{2}{100} \times 60\,000\right)$ ✓

$= \$1800 + \$1200$

$= \$3000$ ✓

END OF SECTION ONE

MATHEMATICS APPLICATIONS

YEAR 11 - UNIT 1

TEST 1 – 2021

CONSUMER ARITHMETIC

SECTION TWO - CALCULATOR ASSUMED

TIME: 30 mins
MARKS: 29 marks

STUDENT'S NAME: SOLUTIONS

CIRCLE YOUR TEACHER'S NAME:

Mrs Indrawirawan	Mr Riemer	Mr Stillitano
Mr Galbraith	Ms Thompson	Mr Hamilton-Brown

- Scientific calculators and/or Classpads are allowed.
- 1 x A4 sheet (single-sided) of notes is allowed.
- A formula sheet will be provided.
- Show all necessary working in order to obtain full marks.

11. A 240 ml cup of coffee at McDougal's costs $4.00, and a 320 ml cup of coffee at Hungry Macs costs $5.00. Justify which size coffee represents better value for money. (3)

McDougal's = $\frac{\$4.00}{240mL}$ = \$0.0167/mL
= 1.67 ¢/mL ✓

Hungry Mac's = $\frac{\$5.00}{320mL}$ = \$0.0156/mL ✓
= 1.56 ¢/mL

∴ The coffee is better at Hungry Macs ∵ as it costs less per mL. ✓

12. Six identical surfboards have a total cost of $4950.00 inclusive of a 10% G.S.T. Determine the pre-G.S.T. price of a single surfboard. (2)

\$4950 ÷ 1.1 ÷ 6 ✓

= \$750 per board (pre G.S.T.) ✓

13. If the average annual inflation rate was 2.5% per annum for the first 3 years, then 3.2% for the next two years, what would be the cost of $4.50 loaf of bread after the five-year period?
A cup of take-away coffee costs $5.00 at today's prices. Assuming an average inflation rate of 3.5% p.a., how long will it take a cup of coffee to double in price? (2)

\$5.00 × 1.035^n = \$10 ✓
(use solve or sequence)

n = 20.15 yrs.
≈ 21 yrs. ✓

14. Justify which account would be 'better' to invest an amount of $2500 over a five-year period.

Account A: Interest compounded annually at a rate of 3.2%
Account B: Interest compounded quarterly at a rate of 3.0% (3)

(A) $A = 2500(1 + 0.032)^5$
= \$2926.43 ✓

(B) $A = 2500(1 + \frac{0.03}{4})^{20}$
= \$2902.96 ✓

∴ Account A would be better as it gives a better return by \$23.47 ✓

15. With one Australian Dollar ($1 AUD) being equivalent to 10 250.4 Indonesian Rupiah (Rp),

a) how many Indonesian Rupiah is equivalent to $250 AUD?

(2)

$1 AUD = 10 250.4 Rp ✓ ×250

×250 ↓ $250 AUD = 2 562 600 Rp ✓

b) how many Australian Dollars is equivalent to 500 000 Rp?

(2)

$1 AUD = 10 250.4 Rp

÷10250.4

$48.78 = 500 000 Rp ✓

÷10250.4 ✓

16. The following statement shows the transactions that occurs in a savings account, paying simple interest of 6.5% p.a. calculated monthly and based on the minimum monthly balance.

Interest earned in October (31 days), November (30 days) and December (31 days) will be added to the account on January 1st.

Calculate the total interest earned for the last three months of the year, to the nearest cent.

(4)

Date	Credit	Debit	Balance
18th September		$420.00	$1 285.50
6th October	$625.00		$1 910.50
5th November		$800.00	$1 110.50
28th November	$480.00		$1 590.50
15th December		$375.00	$1 215.50
31st December			**$1 215.50**

Oct: $1285.50 × 0.065 × $\frac{31}{365}$ = $7.096... ✓

NOV: $1110.50 × 0.065 × $\frac{30}{365}$ = $5.932... ✓

DEC: $1215.50 × 0.065 × $\frac{31}{365}$ = $6.710... ✓

∴ TOTAL = $19.74 ✓

17. Angie has 1800 shares of 'Crypto' with a market value of $5.00 per share. Each share earns a dividend of 4% of the share value. Any earnings made from dividends and/or the sales of these shares are taxed at a rate of 24%.

a) Determine the price to earnings (P/E) ratio of a 'Crypto' share. (2)

$$P/E = \frac{5.00}{(0.04 \times 5.00)} \checkmark$$

$$= \frac{5.00}{0.2}$$

$$= 25 \checkmark$$

b) Calculate how much Angie earned from the sale of all her 'Crypto' shares, after she had collected the dividend. (3)

$$\text{Earnings} = \text{From sales} + \text{From dividends}$$

$$= (1800 \times 5.00) + (1800 \times 0.04 \times 5) \checkmark$$

$$= \$9360 \checkmark$$

$$\text{After Tax} = \$9360 \times 0.76$$

$$= \$7113.60 \checkmark$$

18. George is a sixteen-year-old student, studying full time at Willetton Senior High School and is living with his parents. He has a part-time job which pays $250 per week.

He is entitled to a youth allowance of a maximum of $233.60 per fortnight, but as he has a part-time job this maximum amount could reduce as indicated in the table below:

Fortnightly income	Reduction in fortnightly payment
Up to $427	None – full payment
From $427 and up to $512	50 cents for each dollar over $427
Over $512	$42.50 plus 60 cents for each dollar over $512

Calculate George's fortnightly youth allowance payment. (3)

$$\text{Income} = \$250 \times 2$$

$$= \$500 \text{ / ft} \checkmark$$

$$\text{Allowance} = \$233.60 - (500 - 427) \times 0.5 \checkmark$$

$$= \$197.10 \text{ / ft} \checkmark$$

19. A section of a spreadsheet, provided below, shows the number of hours worked by three students during the course of a week. The students are paid time-and-a-half on Saturdays and double-time on Sundays.

	A	B	C	D	E	F
1	**Name**	**Rate ($/hour)**	**Weekday hours**	**Saturday hours** ×1.5	**Sunday hours** ×2	**Total pay**
2	Harla	20	5	6	3.5	
3	Lilly	22.50	10	3	3	
4	Bella	24.80	8	4	6	

a) How much will Harla earn in a week? (2)

weekdays saturday sunday

$= (20 \times 5) + (20 \times 6 \times 1.5) + (20 \times 3.5 \times 2)$ ✓

$= \$420$ ✓

b) Using spreadsheet cell references, state the formula used and calculate Bella's total pay for one week. (3)

$= (B4 * C4) + (B4 * D4 * 1.5) + (B4 * E4 * 2)$ ✓

$= (24.80 \times 8) + (24.80 \times 4 \times 1.5) + (24.80 \times 6 \times 2)$ ✓

$= \$644.80$ ✓

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END OF SECTION TWO