

Carlingford High School Mathematics Assessment Task



Year 9 (Mathematics 5.2) Term 1 Exam 2020

Student Name: Solutions

9MA2 _____

9MA21 (Mrs Virmani) 9MA2X (Mr Wilson) 9MA2Y (Mr Fardouly/Mrs Strilakos)

Time Allowed: 55 minutes

Instructions:

- All answers must be written in black pen
- An acceptable calculator may be used
- Show all necessary working
- Write all answers clearly (the marker cannot mark what they cannot read!)

Topic	Mark
Financial Mathematics	/27
Algebraic Techniques	/40
Total	/67

Financial Mathematics		
Question, Working and Answer		Marks
1. A music System originally priced at \$16000 is sold for \$1250.	2	
Find the: (a) Loss $16000 - 1250 = 14750$		
(b) Percentage loss 92.18%		
2. A computer salesperson is paid a monthly retainer of \$750 and a commission of 1.5% of the value of computers sold. If his February sales were \$867 400, Calculate their income for this month. $750 + \left(\frac{1.5}{100} \times 867400 \right)$ $750 + 13011$ $\$13761$	2	
3. Calculate the simple interest on an investment of \$280 000 at 8.3% p.a. for 8 years. $\frac{280000 \times 8.3 \times 8}{100} = \185920	2	
4. After 2 years, an investment of \$1560 has earned \$87.36 in simple interest. What is the annual interest rate? $\frac{87.36 + 1560 \times 2 \times 2}{100}$ $\frac{87.36}{1560 \times 2} = 2.8\%$	2	
5. Which one of the following hourly rates is better? (Use 1 year = 52.18 weeks) A. An annual salary of \$54706 for a 38 hour week. $\frac{54706}{38 \times 52.18} = \1982.84 B. \$982 for a 37 hour week. $982 \div 37 = 26.54$ $26.54 < 1982.84$ First is better.	3	

6. Chris earns \$14 for each laptop he sells.

2

How many laptops will Chris need to sell to earn exactly \$280.

$$\begin{array}{r} 280 \\ \hline 14 \\ \hline 20 \end{array}$$

7. Molly earns a salary of \$634 000 p.a. (Use 1 year = 52.18 weeks)

2

(a) How much is she paid each week?

$$\begin{array}{r} 634000 \\ \hline 52.18 \\ \hline 12150.25 \end{array}$$

(a) How much is she paid each fortnight?

$$\begin{array}{r} 12150.25 \\ \hline 2 \\ \hline 6075.125 \end{array}$$

8. Debbie bought 34.8 litres of petrol for \$50.12.

2

What is the cost per litre, correct to nearest cent?

$$\begin{array}{r} 50.12 \\ \hline 34.8 \\ \hline 1.44 \end{array}$$

9. Jessie worked her normal 38 hours, then 4 hours at time and a half and 5 hours at double time. She was paid \$909.90 for the week.

2

Find her hourly rate of pay.

$$\begin{array}{r} \text{hours } 38 + 4 \times 1.5 + 5 \times 2 \\ \hline 54 \\ \hline 16.85 \end{array}$$

10. Shreya works 7.5 hours each weekday and 4 hours on Saturdays, for a total of \$748.66.

2

(a) How many hours does Shreya work?

$$7.5 \times 5 = 37.5$$

(b) How much does she earn per hour?

$$748.66 \div 37.5 = \$19.90$$

11. In a financial year Scott is employed as a hiring manager with a salary of \$78000 per year. He also earns interest that year of \$1580 from a term deposit, and has allowable deductions of \$120 for union fees, \$150 in association fees, \$320 for work-related education expenses, and \$420 for donation to charity.

2

- (a) What is his gross income?

$$78000 + 1580 = \$79580$$

- (b) What is his taxable income?

$$\begin{aligned} &79580 - (120 + 150 + 320 + 420) \\ &= \$78570 \end{aligned}$$

12. Jeremy earns \$2145 per fortnight and has allowable annual deduction of \$337.

2

Taxable Income (\$)	Tax Payable (\$)
0 – \$18 200	Nil
\$18 201 – \$37 000	19c for each \$1 over \$18 200
\$37 001 – \$90 000	\$3 572 plus 32.5% of amounts over \$37 000
90 001 – 180 000	\$20 797 plus 37% of amounts over \$90 000
\$180 001 and over	\$54 096 plus 45% of amounts over \$180 000

Use the given tax table to find how much tax he should have paid.

$$\text{Taxable income} = 2145 \times 26 - 337 = \$55433$$

$$\begin{aligned} \text{Tax} &: 3572 + 32.5\% \text{ of } (55433 - 3700) \\ &\$9562.73 \end{aligned}$$

13. Sofia earns a gross income of \$864.25 per week. Her deductions are \$141.94 for tax and \$51.33 for private health insurance. Find:

2

- (a) Sofia's net income.

$$\begin{aligned} &864.25 - (141.94 + 51.33) \\ &= \$670.98 \end{aligned}$$

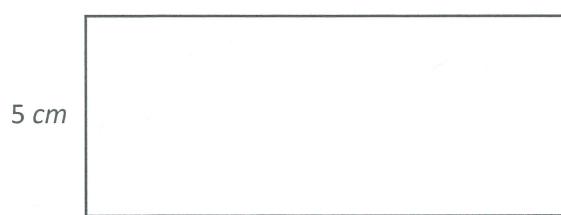
- (b) Net Income as a percentage of her gross income, correct to 1 decimal place.

$$\begin{aligned} &\frac{670.98}{864.25} \times 100 = 77.6\% \end{aligned}$$

Algebraic Techniques		
Question, Working and Answer		Marks
1. Write an algebraic expression for each statement.	4	
(a) Five more than a number n . $n+5$		
(b) Five subtracted from the product of 5 and a number x . $5x - 5$		
(c) Two subtracted from t then divided by 7. $(t-2) \div 7$		
(d) The product of n and m . nm		
2. Find the value of $3x^2 - 2y$, where $x = -4$ and $y = 7$.	2	
$\begin{aligned} & 3(-4)^2 - 2(7) \\ & = 34 \end{aligned}$		
3. Simplify:	10	
(a) $9b - 12b^2 - 6b^2 - 15 + 3b$ $12b - 18b^2 - 15$		
(b) $2fg + 3fg - 6gf + 2$ $2 - gf$		
(c) $2 \times 5p \times 7x$ $70px$		
(d) $-25yz \div 5y$ $-5z$		
(e) $\frac{9p}{-45pq}$ $\begin{array}{r} -1 \\ \hline 5q \end{array}$		

4. Write a simplified algebraic expression for perimeter of a rectangle with dimensions $10x\text{ cm}$ and 5cm .

2



$$\begin{aligned} P &= 10x + 5 + 10x + 5 \\ &= 20x + 10 \end{aligned}$$

5. Simplify:

(a)

$$\frac{11y}{2h} - \frac{7y}{2h} = \frac{4y}{2h} = \frac{2y}{h}$$

2

(b)

$$\frac{3}{4} + \frac{7a}{10} = \frac{30 + 28a}{40} \quad \text{or} \quad \frac{15 + 14a}{20}$$

2

(c)

$$\frac{6}{r} \times \frac{5r}{9} \div \frac{15}{h} = \frac{30h}{135} = \frac{2h}{9}$$

3

6. (a) Expand and simplify:

(i) $4y(1 + 3y)$

$$4y + 12y^2$$

6

(ii) $8 - 5(2x - 7)$

$$\begin{aligned} &8 - 10x + 35 \\ &= 43 - 10x \end{aligned}$$

(b) Factorise $15k - 10k^2h + 5k$

$$5k(4 - 2kh)$$

7. Expand and simplify the following binomial products.

4

(a) $(4r - 35)(4r + 35)$

$16r^2 - 1225$

(b) $(2r + 5)(3r - 7)$

$6r^2 + r - 35$

8. A rectangular mat has length 100cm and width 75cm . The length and width are both increased by $x\text{ cm}$.

5

(a) Write an expression for the new length of the mat.

$100 + x$

(b) Write an expression for the new width of the mat.

$75 + x$

(c) Hence write a simplified expression for the new area of the mat.

$$\begin{aligned} & (100 + x)(75 + x) \\ & = 7500 + 175x + x^2 \end{aligned}$$

(d) By how much has the area of the mat increased?

$175x + x^2$

(e) If $x = 1\text{ cm}$, find the new area.

7676cm^2

END OF TEST