

STANDARD 2 (2027)

Stage 6



Financial Maths (Std2-2027)

Earning Money (Y11)

Ways of Earning

Taxation

Teacher: Haeun Jang

Exam Equivalent Time: 106.5 minutes *(based on allocation of 1.5 minutes per mark)*

Questions

1. Financial Maths, STD2 2010 HSC 23a

This advertisement appeared in a newspaper

Civil Engineer

Base rate of pay: \$1586.70 per week.

Depending upon qualifications and experience, up to an additional 3.5% may be added to the weekly base rate of pay.

What is the maximum possible salary per annum for this civil engineer, correct to the nearest dollar? *(2 marks)*

2. Financial Maths, STD2 2011 HSC 23a

Sri has a gross salary of \$56 350. She has tax deductions of \$350 for union fees, \$2000 in work-related expenses and \$250 in donations to charities.

The Medicare levy is 1.5% of her taxable income.

Calculate Sri's Medicare levy. *(3 marks)*

3. Financial Maths, STD2 2024 HSC 23

Zazu works a 38-hour week and is paid at an hourly rate of \$45. Any overtime hours worked are paid at time-and-a-half.

In a particular week, Zazu worked the regular 38 hours and some overtime hours. In that week Zazu earned \$2790.

How many hours of overtime did Zazu work in that week? *(3 marks)*

4. Financial Maths, STD2 2022 HSC 21

A real estate agent's commission for selling houses is 2% for the first \$800 000 of the sale price and 1.5% for any amount over \$800 000.

Calculate the commission earned in selling a house for \$1 500 000. *(2 marks)*

5. Financial Maths, STD2 2008 HSC 24a

Bob is employed as a salesman. He is offered two methods of calculating his income.

Method 1: Commission only of 13% on all sales

Method 2: \$350 per week plus a commission of 4.5% on all sales

Bob's research determines that the average sales total per employee per month is \$15 670.

a. Based on his research, how much could Bob expect to earn in a year if he were to choose Method 1? *(2 marks)*

b. If Bob were to choose a method of payment based on the average sales figures, state which method he should choose in order to earn the greater income. Justify your answer with appropriate calculations. *(3 marks)*

6. Financial Maths, STD2 EQ-Bank 17

Roberto works as a furniture assembler and is paid \$18.50 for each bookshelf he completes. In one week he worked 40 hours and earned \$1110.

a. How many bookshelves did Roberto complete that week? *(1 mark)*

b. Calculate his hourly rate of pay. *(2 marks)*

7. Financial Maths, STD2 EQ-Bank 19

Michael is a children's book author. His publisher printed 25000 copies of his new book and after 6 months there are 9200 copies left in stock. Michael receives 12% of the retail price as royalties.

a. How many copies of Michael's book were sold? *(1 mark)*

b. Calculate Michael's royalty payment if the retail price is \$19.95. *(2 marks)*

c. The publisher decides to sell the remaining stock at a reduced price of \$15.00 per book. Calculate Michael's total royalty payment if all the remaining books are sold at this price. *(2 marks)*

8. Financial Maths, STD2 2016 HSC 26e

Jenny earns a yearly salary of \$63 752. Her annual leave loading is 17.5% of four weeks pay.

Calculate her total pay for her four weeks of annual leave. *(3 marks)*

9. Financial Maths, STD2 2016 HSC 26f

Theo is completing his tax return. He has a gross salary of \$82 521 and income from a rental property totalling \$10 920. He is claiming \$13 420 in allowable deductions.

- a. Determine Theo’s taxable income. (1 mark)
- b. Using the tax table below, calculate Theo’s tax payable. (2 marks)

Taxable income	Tax payable
\$0 – \$18200	Nil
\$18201 – \$37000	19 cents for each \$1 over \$18 200
\$37001 – \$80000	\$3572 plus 32.5 cents for each \$1 over \$37 000
\$80001 – \$180000	\$17 547 plus 37 cents for each \$1 over \$80 000
\$180001 and over	\$54 547 plus 45 cents for each \$1 over \$180 000

- c. In addition to the above tax, Theo must also pay a Medicare levy of \$1600.42
Theo has already paid \$20 525 as Pay As You Go (PAYG) tax.
Should Theo receive a tax refund or will he owe more tax? Justify your answer with calculations. (2 marks)

10. Financial Maths, STD2 2017 HSC 29b

Sabrina’s taxable income is \$86 725 in a particular year.

The table below is used to calculate her tax payable. In addition, she pays the Medicare levy, which is 2% of her taxable income.

Taxable income	Tax payable
\$0 – \$18200	Nil
\$18201 – \$37000	19 cents for each \$1 over \$18 200
\$37001 – \$87000	\$3572 plus 32.5 cents for each \$1 over \$37 000
\$87001 – \$180000	\$19 822 plus 37 cents for each \$1 over \$87 000
\$180001 and over	\$54 232 plus 45 cents for each \$1 over \$180 000

Calculate Sabrina’s net income in that year. (3 marks)

11. Financial Maths, STD2 2018 HSC 30b

Last year, Luke’s taxable income was \$87 000 and the tax payable on this income was \$19 822. This year, Luke’s taxable income has increased by \$16 800.

- a. Use the table to calculate the tax payable by Luke this year. (2 marks)

Taxable income	Tax payable
\$0 – \$18200	Nil
\$18201 – \$37000	19 cents for each \$1 over \$18 200
\$37001 – \$87000	\$3572 plus 32.5 cents for each \$1 over \$37 000
\$87001 – \$180000	\$19 822 plus 37 cents for each \$1 over \$87 000
\$180001 and over	\$54 232 plus 45 cents for each \$1 over \$180 000

- b. How much extra money will Luke have this year, after paying tax, as a result of the increase in his taxable income? Ignore the Medicare levy. (2 marks)

12. Financial Maths, STD2 2019 HSC 32

The table shows the income tax rates for the 2018-2019 financial year.

Taxable income	Tax payable
\$0 – \$18200	Nil
\$18201 – \$37000	19 cents for each \$1 over \$18 200
\$37001 – \$90000	\$3572 plus 32.5 cents for each \$1 over \$37 000
\$90001 – \$180000	\$20 797 plus 37 cents for each \$1 over \$90 000
\$180001 and over	\$54 097 plus 45 cents for each \$1 over \$180 000

The Medicare levy is calculated as 2% of taxable income.
For the 2018-2019 financial year, Charlie pays a Medicare levy of \$1934.80.
Calculate the tax payable on Charlie’s taxable income. (3 marks)

13. Financial Maths, STD2 EQ-Bank 23

Jessica works in a shoe factory and is paid \$5.40 for each pair of shoes she completes. Last week she worked 9 hours per day for 4 days and completed 180 pairs of shoes.

Calculate her hourly rate of pay. (2 marks)

14. Financial Maths, STD2 EQ-Bank 25

Sophie is a songwriter and receives a royalty of 9.5% on the sales of her music album.
Calculate Sophie’s royalty payment if 15600 albums were sold at \$22.95 each. (2 marks)

15. Financial Maths, STD2 2020 HSC 20

The table shows the income tax rates for the 2019 – 2020 financial year.

<i>Taxable income</i>	<i>Tax payable</i>
\$0 – \$18 200	Nil
\$18 201 – \$37 000	19 cents for each \$1 over \$18 200
\$37 001 – \$90 000	\$3572 plus 32.5 cents for each \$1 over \$37 000
\$90 001 – \$180 000	\$20 797 plus 37 cents for each \$1 over \$90 000
\$180 001 and over	\$54 097 plus 45 cents for each \$1 over \$180 000

For the 2019 – 2020 financial year, Wally had a taxable income of **\$122 680**. During the year, he paid **\$3000** per month in Pay As You Go (PAYG) tax.

Calculate Wally's tax refund, ignoring the Medicare levy. *(3 marks)*

16. Financial Maths, STD2 2021 HSC 22

The table shows the income tax rates for the 2020-2021 financial year.

<i>Taxable income</i>	<i>Tax payable on this income</i>
0 – \$18 200	Nil
\$18 201 – \$45 000	19 cents for each \$1 over \$18 200
\$45 001 – \$120 000	\$5092 plus 32.5 cents for each \$1 over \$45 000
\$120 001 – \$180 000	\$29 467 plus 37 cents for each \$1 over \$120 000
\$180 001 and over	\$51 667 plus 45 cents for each \$1 over \$180 000

William has a gross annual salary of **\$84 000**. He has allowable tax deductions of **\$900** for home-office equipment and **\$474** for union fees. William must also pay a Medicare Levy of 2% of his taxable income.

Calculate the total tax payable by William including the Medicare Levy. *(3 marks)*

17. Financial Maths, STD2 2023 HSC 37

The table shows personal income tax rates for different taxable incomes for a particular country.

<i>Taxable income</i>	<i>Tax payable</i>
\$0 – \$11 000	Nil
\$11 001 – \$42 400	20 cents for each \$1 over \$11 000
\$42 401 – \$78 800	\$6280 plus 33 cents for each \$1 over \$42 400
\$78 801 – \$108 400	\$18 292 plus <i>X</i> cents for each \$1 over \$78 800
\$108 401 and over	\$31 316 plus 48 cents for each \$1 over \$108 400

A person with a taxable income of **\$90 000** pays 25.8% of that income in tax (excluding any levies).

What is the value of *X* in the table? *(3 marks)*

18. Financial Maths, STD2 2025 HSC 31

The table shows the income tax rate for Australian residents for the 2024-2025 financial year.

<i>Taxable income</i>	<i>Tax on this income</i>
0 – \$18 200	Nil
\$18 201 – \$45 000	16 cents for each \$1 over \$18 200
\$45 001 – \$135 000	\$4288 plus 30 cents for each \$1 over \$45 000
\$135 001 – \$190 000	\$31 288 plus 37 cents for each \$1 over \$135 000
\$190 001 and over	\$51 638 plus 45 cents for each \$1 over \$190 000

At the end of the 2024-2025 financial year, Alex's tax payable was **\$47 420**, excluding the Medicare levy.

What was Alex's taxable income? *(3 marks)*

19. Financial Maths, STD2 EQ-Bank 28

Ian works in a packaging factory and is paid \$0.85 for each box he packs. Last month he worked 160 hours and packed 8960 boxes.

- a. Calculate Ian's total earnings for the month. *(1 mark)*
- b. The following month the factory decides to pay Ian a flat hourly rate of \$44.50. What percentage increase/decrease is this from his equivalent hourly wage of the previous month. Give your answer correct to 1 decimal place. *(2 marks)*

20. Financial Maths, STD2 2004 HSC 27b

David is paid at these rates:

Weekday rate	\$18.00 per hour
Saturday rate	Time-and-a-half
Sunday rate	Double time

His time sheet for last week is:

	<i>Start</i>	<i>Finish</i>	<i>Unpaid break</i>
Friday	9.00 am	1.30 pm	30 minutes
Saturday	9.00 am	4.00 pm	1 hour
Sunday	8.00 am	2.00 pm	1 hour

- a. Calculate David's gross pay for last week. *(3 marks)*
- b. David decides not to work on Saturdays. He wants to keep his weekly gross pay the same. How many extra hours at the weekday rate must he work? *(1 mark)*

21. Financial Maths, STD2 2013 HSC 27b

The table shows the tax payable to the Australian Taxation Office for different taxable incomes.

<i>Taxable income</i>	<i>Tax on this income</i>
\$0 – \$18 200	Nil
\$18 201 – \$37 000	19c for each \$1 over \$18 200
\$37 001 – \$80 000	\$3572 plus 32.5c for each \$1 over \$37 000
\$80 001 – \$180 000	\$17 547 plus 37c for each \$1 over \$80 000
\$180 001 and over	\$54 547 plus 45c for each \$1 over \$180 000

Acknowledgment: © Australian Taxation Office for the Commonwealth of Australia

Peta has a gross annual salary of \$84 000. She has tax deductions of \$1000 for work-related travel and \$500 for stationery. The Medicare levy that she pays is calculated at 1.5% of her taxable income.

Peta has already paid \$18 500 in tax.

Will Peta receive a tax refund or will she owe money to the Australian Taxation Office? Justify your answer by calculating the refund or amount owed. *(4 marks)*

22. Financial Maths, STD2 EQ-Bank 40

Yuki works as a musician and receives royalties from streaming services. A spreadsheet is used to calculate her quarterly royalty earnings.

Total royalty earnings = Number of streams × Royalty rate per stream

A spreadsheet showing Yuki's quarterly royalty earnings is shown.

	A	B
1	Yuki's Quarterly Royalty Earnings	
2		
3	Inputs	
4	Number of streams	875 000
5	Royalty rate per stream (\$)	0.004
6		
7	Output	
8	Total royalty earnings (\$)	3500
9		

In the following quarter, Yuki's total royalty earnings were \$4200. The royalty rate per stream remained at \$0.004. Calculate the number of streams Yuki received that quarter. *(2 marks)*

Financial Mathematics Question Banks

ICE-EM Mathematics 10 (4th ed.), Chapter 1 — Review & Challenge Exercises

Review Exercise

1. Find the simple interest payable in each case.
 - a. \$10 000 borrowed for six years at 9% p.a.
 - b. \$3000 borrowed for 15 years at 6% p.a.
 - c. \$1500 borrowed for 40 years at 2.5% p.a.
2. What principal will earn \$1000 simple interest at:
 - a. 4% p.a. over five years?
 - b. 10% p.a. over three years?
 - c. 6% p.a. over eight years?
 - d. 2.5% p.a. over 10 years?
3. At what rate of simple interest will:
 - a. \$10 000 grow to \$14 000 over a five-year period?
 - b. \$8000 grow to \$10 000 over a two-year period?
 - c. \$1500 grow to \$2000 over a three-year period?
4. If a woman borrows \$750 to buy a television and agrees to pay back \$870 in one year's time, what annual rate of simple interest is she being charged?
5. An investor bought an antique table for \$6000. He paid 5% as a deposit and borrowed the remainder from a bank for two years at 18% p.a. simple interest, payable monthly. How much interest does he have to pay each month?
6. Find the new value if:
 - a. 60 is increased by 10%
 - b. 50 is increased by 150%
 - c. 80 is decreased by 20%
 - d. 200 is increased by $12\frac{1}{2}\%$
 - e. 400 is decreased by 2.5%
 - f. 312 is decreased by $5\frac{1}{4}\%$
7. A clothing store offers a 15% discount on all its summer stock. How much will I need to pay in total if I buy a shirt with a marked price of \$35, a pair of shorts with a marked price of \$25, and a cotton sweater with a marked price of \$50?
8. A general store in a country town adds 8% to the recommended retail price of all its stock due to transport costs. What will be the total charge if I buy a torch with a retail price of \$9.50, a tin of coffee with a retail price of \$11.30, and a hat with a retail price of \$42.00?

- 9. a.** What is the final value if:
- i.** 90 is increased by 10%?
 - ii.** 120 is decreased by 20%?
 - iii.** 96 is increased by 4%?
 - iv.** 108 is decreased by 8%?
- b.** Look carefully at the results of part a i–iv. Do they surprise you?
- 10.** A computer store states that it will reduce the price of a computer by 10% each day until it is sold. The original price of the computer is \$2500.
- a.** What is the sale price after the first reduction?
 - b.** What is the sale price after the second reduction?
 - c.** What is the sale price after the third reduction?
 - d.** What single percentage decrease has the same effect as the three 10% reductions?
- 11.** A manufacturer of suits can produce a suit at a cost of \$250. When he sells it to a clothing store owner, he makes a 20% profit on the suit. To cover costs, the store owner increases the cost of the suit a further 30%.
- a.** For what price does the store owner sell the suit?
 - b.** What is the total percentage increase in the cost of the suit?
- 12.** The population of a country increased by 3%, 2.6% and 1.8% in three successive years. What was the total percentage increase in the country's population over the three-year period?
- 13.** Find the balance if:
- a.** \$2000 is invested for 10 years at 8% p.a. compounded annually
 - b.** \$5000 is invested for six years at 1% per month compound interest
 - c.** \$500 is invested for 40 years at 3% per six-month period compound interest.
- 14.** A piece of machinery has an initial value of \$25 000. Due to usage and age, its value depreciated by 8% each year. Find the value of the piece of machinery after:
- a.** three years
 - b.** five years
 - c.** 10 years
 - d.** n years.
- 15.** A new car is valued at \$26 000. It is estimated to depreciate by 12% each year.
- a.** Find its depreciated value after five years.
 - b.** Find its depreciated value after 10 years.
 - c.** Find how many years it takes for its depreciated value to fall below \$11 000.
- 16.** Jo bought a four-year old car for \$20 880.25 at its correct depreciated value. If the car has a depreciation rate of 15% p.a., find the value of the car when it was brand new.

Challenge Exercise

1. Waleed owns a portfolio of shares that he purchased for \$38 000. For the first four years, the portfolio appreciated in value at an average of 8% each year, but for the next four years, it depreciated in value at an average of 8% each year. Calculate:
 - a. the value of the portfolio, correct to the nearest dollar, at the end of these eight years
 - b. the equivalent simple interest rate of change in value per year, correct to two decimal places, over these eight years.
2. Two banks offer the following investment packages.

Bank A: 6.5% p.a. compounded annually, fixed for six years

Bank B: 5.3% p.a. compounded annually, fixed for eight years

 - a. Which bank's package will yield the greater interest?
 - b. If a customer invests \$10 000 in Bank A, how much would she have to invest with Bank B to produce the same amount produced by Bank A at the end of the investment period?
4. The population of a town decreases by 11% during 2024. What percentage increase is necessary during 2025 for the population to be restored to its population immediately before 2024?
6. A man earns a salary of \$2440 for working a 44-hour week. His weekly salary is increased by 12.5% and his hours are reduced by 10%. Find the percentage increase in his new hourly salary.
8. Andrea buys a house and she spends an extra 10% of what she paid for the house on repairs. She takes out a loan and pays 5% p.a. compound interest on the total amount spent (including repairs). Three years later she sells the house for \$565 100 and she gains 20% on the whole investment purchase price. How much did she pay for the house?
9. Anthony invests \$P for 2 years at $r\%$ p.a. compound interest. At the end of the 2 years, Anthony receives his original \$P and $\$P/10$ in interest. Find r , correct to two decimal places.

Smartered Financial Mathematics QB Answers

Q1.	<i>Max weekly base = \$1642.33 (nearest cent)</i> <i>Max annual salary = \$85396</i>
Q2.	<i>Medicare Levy = \$806.25</i>
Q3.	<i>Total pay = $(38 \times 45) + (x \times 1.5 \times 45)$</i> <i>$x = 16$ hours of overtime</i>
Q4.	<i>Commission = \$26,500</i>
Q5.	a) \$24,450.20 b) \$26,661.80
Q6.	a) 60 bookshelves b) <i>Hourly rate = \$27.75</i>
Q7.	a) Copies sold = 15,800 copies b) Royalty payment = \$37,825.20 c) Total royalty payment = \$54,385.20
Q8.	<i>Annual leave pay = \$5762.20</i>
Q9.	a) <i>Taxable income = \$80,021</i> b) <i>Tax payable = \$17,554.77</i> c) Refund of \$1369.81
Q10.	<i>Net Income = \$65,257.87</i>
Q11.	a) <i>Tax payable = \$26,038</i> b) <i>Extra money = \$10,584</i>

Q12.	<i>Tax payable = \$23,290.80</i>
Q13.	<i>Hourly rate of Jessica = \$27.00</i>
Q14.	<i>Royalty payment = \$34,011.90</i>
Q15.	<i>Tax refund = \$3111.40</i>
Q16.	<i>Total tax payable = \$18,972.97</i>
Q17.	<i>Equating with tax payable formula in the table:</i> <i>$X = 44$ cents</i>
Q18.	<i>Alex's taxable income = \$178,600</i>
Q19.	a) <i>Total Earnings = \$7616</i> b) <i>% decrease = $\frac{\text{hourly rate last month} - \text{new hourly rate}}{\text{hourly rate last month}}$</i> <i>$\therefore 6.5\%$ decrease</i>
Q20.	a) \$414.00 b) <i>9 extra hours at the weekday.</i>
Q21.	<i>Tax liability of \$1209.50</i>
Q22.	<i>1,050,000 streams</i>

Extra Financial Mathematics QB Answers

Review exercise

- 1 a \$5400 b \$2700 c \$1500
- 2 a \$5000 b \$3333.33
 c \$2083.33 d \$4000
- 3 a 8% b $12\frac{1}{2}\%$ c $11\frac{1}{9}\%$
- 4 16%
- 5 \$85.50
- 6 a 66 b 125 c 64
 d 225 e 390 f 295.62
- 7 \$93.50
- 8 \$67.82
- 9 a i 99 ii 96 iii 99.84 iv 99.36
 b No, they all end up close to 100.
- 10 a 2250 b \$2025
 c \$1822.50 d 27.1%
- 11 a \$390 b 56%
- 12 7.58%
- 13 a \$4317.85 b \$10 235.50 c \$5320.45
- 14 a \$19 467.20 b \$16 477.04
 c \$10 859.71 d $25\,000(0.92)^6$
- 15 a \$13 721.03 b \$7241.03 c 7 years
- 16 \$40 000

Challenge exercise

- 1 a \$ 37 036 b 0.32% decrease
- 2 a Bank B b \$9653.19
- 4 12.36%
- 6 25%
- 8 \$369 814.11
- 9 $r \approx 4.88$