

Welcome to the SmarterMaths 2026 HSC Standard 2 Revision Series.

Key features of this year's Revision Series include:

- ~15 hours of carefully selected HSC revision questions
- Targeted practice across the most important HSC question types
- Designed for students aiming for a Band 5-6 result
- Higher weighting towards historically difficult question types
- Topic and question weightings reflect historical HSC exam allocations
- Greater emphasis on Std2/Adv common questions due to their historical importance in achieving high band results.
- Build your own personalised revision resource by **carefully reviewing and annotating** these worksheets throughout Term 3.

**Philosophy: Every question has earned its place. Historical HSC trends, common question types and past areas of student difficulty have all influenced the selection process.*

IMPORTANT

If you've already completed some of these questions during the year, **that's a good thing.**

Many of the highest-performing students credit repeated practice with challenging past HSC questions as a key ingredient in their HSC success. This revision series focuses on the highest-value question types, helping you build confidence and critically, *speed* through the exam.

HSC Final Study – Standard 2 Financial Maths

Worksheet 2 of 2 | Estimated exam weighting: 22.9%

Syllabus: F4 Investments and Loans, F5 Annuities

Key Areas addressed by this worksheet:

F4 Investments and Loans (9.8%)

- **Compound Interest:** The use of the compound formula $FV = PV(1 + r)^n$ (★) has been examined in 8 of the last 10 years (notably absent in 2025) and is revised in multiple questions.
- Comparing compound interest vs simple interest investments is a common question type. *2021 Std2 26b* (★) is a must review question in this area.
- Questions involving *Compounded Value of \$1* tables have traditionally caused students problems and we note they were last examined in 2018.
- **Shares** (★): dividend yield is a challenging topic that demands revision attention (last examined in 2025).
- **Declining Balance Depreciation** (★): tested in each of the last 4 HSC exams in questions each worth 3-4 marks. A comparison of declining balance and straight-line depreciation (★) is commonly tested, most recently in 2022-23.
- *2020 Std2 11 MC* caused problems with a 6-monthly depreciation period, producing a mean mark of 43% - revision attention required here.
- **Credit Cards** (★): asked in four new syllabus exams (most recently in 2025). Sub-50% mean marks are common, making this a key revision area.
- Calculating daily interest rates and applying the correct number of days has proven very challenging for the majority of students. Multiple revision questions address this.
- **Loans:** Exposure to different loan payment table styles is critical. Covered by numerous examples including the very challenging *2023 Std2 29* (★).
- "*Loan P+I-R Table*" (★) style questions have appeared in the 2024 and 2022 exams, receiving significant mark allocations on each occasion. Interpreting these tables is a key competence.
- *2025 Std2 33* (★) saw flat rate loans tested – Boom!

F5 Annuities (6.8%)

- **Annuities** (★): has attracted huge allocations of between 5-8 marks in each of the last 5 exams. It is an important area for Std2/Adv common questions and is treated as a major revision focus area.
- *Future Value of an Annuity Table* (★) has been the most regularly asked question type and is well covered (note it has produced sub-50% mean marks in a majority of questions).
- We include the very important *2021 Std2 40* (★) and *2019 Std2 42* (★) which require a deeper understanding of these tables than in previous years.
- Exposure to other types of annuity tables that have been poorly answered such as *Present Value Annuity Tables* (★) (*tested in 2024, 2021 and 2020*) and the *Contribution per period for a future value of \$1 table* (*2016*).
- Recurrence relations within annuities had its first appearance in *2020 Std2 34* (★) which is a "must review" question.

KEY: ★ Priority Revision – content or specific questions flagged by SM analysis as key revision.

STANDARD 2

2026

HSC Revision Series

Financial Maths (2 of 2)

F4 Investments and Loans (Y12)

F5 Annuities (Y12)

Exam Equivalent Time: 120 minutes (based on allocation of 1.5 minutes per mark)

Questions

1. Financial Maths, STD2 F4 2021 HSC 4 MC

Three years ago an appliance was valued at \$2467. Its value has depreciated by 15% each year, based on the declining-balance method.

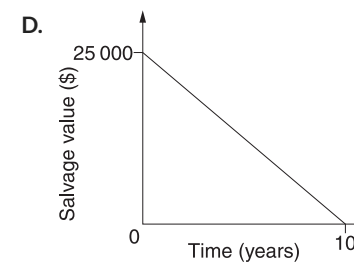
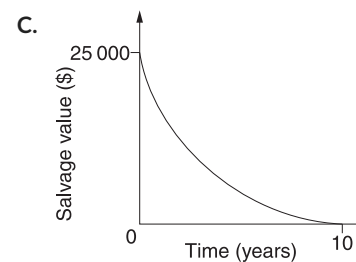
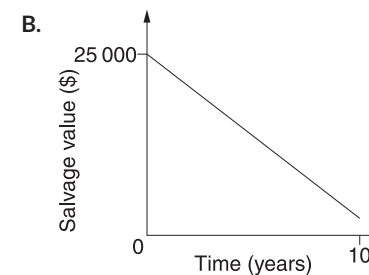
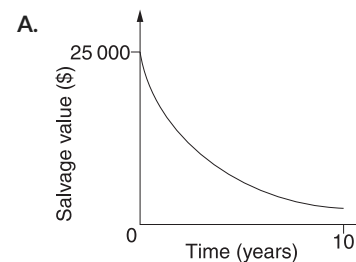
What is the salvage value today, to the nearest dollar?

- A. \$952
- B. \$1110
- C. \$1357
- D. \$1515

2. Financial Maths, STD2 F4 2012 HSC 16 MC

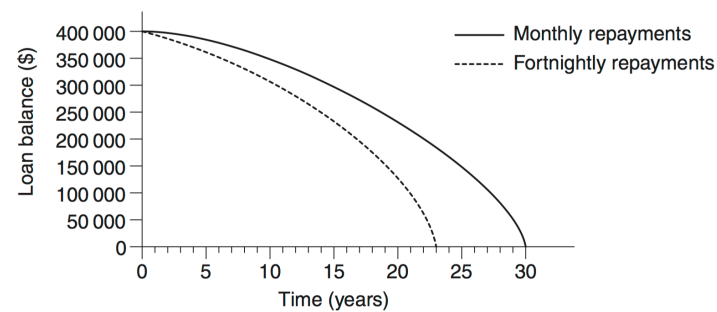
A machine was bought for \$25 000.

Which graph best represents the salvage value of the machine over 10 years using the declining balance method of depreciation?



3. Financial Maths, STD2 F4 2012 HSC 24 MC

A \$400 000 loan can be repaid by making either monthly or fortnightly repayments.
The graph shows the loan balances over time using these two different methods of repayment.

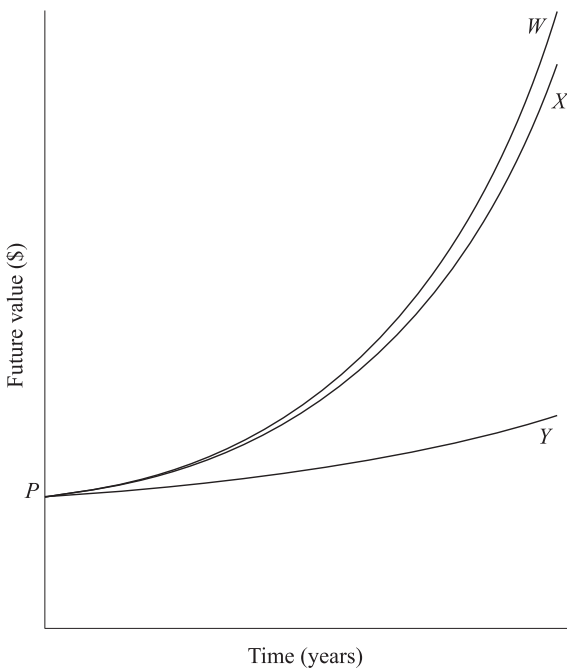


The monthly repayment is \$2796.86 and the fortnightly repayment is \$1404.76.
What is the difference in the total interest paid using the two different methods of repayment, to the nearest dollar?

- A. \$51 596
- B. \$166 823
- C. \$210 000
- D. \$234 936

4. Financial Maths, STD2 F4 2019 HSC 13 MC

The graph show the future values over time of \$P, invested at three different rates of compound interest.



Which of the following correctly identifies each graph?

A.	<i>W</i>	5% pa, compounding annually
	<i>X</i>	10% pa, compounding annually
	<i>Y</i>	10% pa, compounding quarterly

B.	<i>W</i>	5% pa, compounding annually
	<i>X</i>	10% pa, compounding quarterly
	<i>Y</i>	10% pa, compounding annually

C.

W	10% pa, compounding quarterly
X	10% pa, compounding annually
Y	5% pa, compounding annually

D.

W	10% pa, compounding annually
X	10% pa, compounding quarterly
Y	5% pa, compounding annually

5. Financial Maths, STD2 F4 2024 GEN1 21 MC

Lee took out a loan of \$121 000, with interest compounding monthly. He makes monthly repayments of \$2228.40 for five years until the loan is repaid in full.

The total interest paid by Lee is closest to

- A. \$4434
- B. \$5465
- C. \$10 539
- D. \$12 704

6. Financial Maths, STD2 F4 2024 HSC 7 MC

Three years ago, the price of a uniform was \$180.

Due to inflation, the price increased annually by 2.5%.

What is the price of this uniform now?

- A. \$180.14
- B. \$ 181.35
- C. \$ 193.50
- D. \$ 193.84

7. Financial Maths, STD2 F1 2017 HSC 11 MC

A new car was bought for \$19 900 and one year later its value had depreciated to \$16 300.

What is the approximate depreciation, expressed as a percentage of the purchase price?

- A. 18%
- B. 22%
- C. 78%
- D. 82%

8. Financial Maths, STD2 F5 2014 HSC 21 MC

A table of future value interest factors is shown.

Table of future value interest factors					
Period	Interest rate per period				
	1%	2%	3%	4%	5%
1	1.0000	1.0000	1.0000	1.0000	1.0000
2	2.0100	2.0200	2.0300	2.0400	2.0500
3	3.0301	3.0604	3.0909	3.1216	3.1525
4	4.0604	4.1216	4.1836	4.2465	4.3101

A certain annuity involves making equal contributions of \$25000 into an account every 6 months for 2 years at an interest rate of 4% per annum.

Based on the information provided, what is the future value of this annuity?

- A. \$50 500
- B. \$51 000
- C. \$103 040
- D. \$106 162

9. Financial Maths, STD2 F4 2018 HSC 19 MC

The table shows the compounded values of \$1 at different interest rates over different periods.

Compounded values of \$1

Number of periods	Interest rate per period				
	1%	2%	3%	4%	5%
2	1.0201	1.0404	1.0609	1.0816	1.1025
4	1.0406	1.0824	1.1255	1.1699	1.2155
6	1.0615	1.1262	1.1941	1.2653	1.3401
8	1.0829	1.1717	1.2668	1.3686	1.4775
10	1.1046	1.2190	1.3439	1.4802	1.6289
12	1.1268	1.2682	1.4258	1.6010	1.7959

Amy hopes to have \$21 000 in 2 years to buy a car. She opens an account today which pays interest of 4% pa, compounded quarterly.

Using the table, which expression calculates the minimum single sum that Amy needs to invest today to ensure she reaches her savings goal?

- A. $21\,000 \times 1.0816$
 - B. $21\,000 \div 1.0816$
 - C. $21\,000 \times 1.0829$
 - D. $21\,000 \div 1.0829$
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10. Financial Maths, STD2 F5 2020 HSC 14 MC

An annuity consists of ten payments, each equal to \$1000. Each payment is made on 30 June each year from 2021 through to 2030 inclusive.

The rate of compound interest is 5% per annum.

The present value of the annuity is calculated at 30 June 2020.

The future value of the annuity is calculated at 30 June 2030.

Without performing any calculations, which of the following statements is true?

- A. Present value of the annuity < \$10 000 < future value of the annuity
 - B. \$10 000 < present value of the annuity < future value of the annuity
 - C. Future value of the annuity < \$10 000 < present value of the annuity
 - D. \$10 000 < future value of the annuity < present value of the annuity
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11. Financial Maths, STD2 F4 2020 HSC 11 MC

An asset is depreciated using the declining-balance method with a rate of depreciation of 8% per half year. The asset was bought for \$10 000.

What is the salvage value of the asset after 5 years?

- A. \$1749.01
 - B. \$4182.12
 - C. \$4343.88
 - D. \$6590.82
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12. Financial Maths, STD2 F5 2013 23 MC

Zina opened an account to save for a new car. Six months after opening the account, she made first deposit of \$1200 and continued depositing \$1200 at the end of each six month period. Interest was paid at 3% per annum, compounded half-yearly.

How much was in Zina's account two years after first opening it?

- A. \$4909.08
 - B. \$4982.72
 - C. \$5018.16
 - D. \$5094.55
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13. Financial Maths, STD2 F4 2010* HSC 22 MC

In July, Ms Alott received a statement for her credit card account. The account has no interest free period. Compound interest is calculated daily and charged to her account on the statement date.

Ms I O Alott

Dollar Bank



Credit limit: \$5000

Credit card statement

Statement date: 23 July 2010

Previous Balance	Payments	Purchases	Interest charged
\$529.46	\$529.46	\$1721.50	?

Date	Purchases	Amount	Closing Balance
29 June	Hi-Fi	\$1721.50	?

Annual percentage rate: 19%

Daily percentage rate: 0.0521%

Note: Interest is charged on amounts from (and including) the date of purchase up to (and including) the statement date.

Minimum payment due: \$25 or 5% of closing balance whichever is the larger.

What is the minimum payment due on this account?

- A. \$23.56
- B. \$25.00
- C. \$86.08
- D. \$87.20

14. Financial Maths, STD2 F4 2015 HSC 26d

A family currently pays \$320 for some groceries.

Assuming a constant annual inflation rate of 2.9%, calculate how much would be paid for the same groceries in 5 years' time. (2 marks)

15. Financial Maths, STD2 F4 2019 HSC 21

A person owns 1526 shares with a market value of \$8.75 per share. The total dividend received for these shares is \$1068.20.

Calculate the percentage dividend yield. (2 marks)

16. Financial Maths, STD2 F4 2025 HSC 23

Company A and Company B both issue an annual dividend per share as shown in the table.

<i>Company</i>	<i>Current share price</i>	<i>Annual dividend per share</i>
A	\$25.43	\$4.92
B	\$2.13	45c

Based on the dividend yield, which company would be better to invest in? (2 marks)

[illegible]

17. Financial Maths, STD2 F4 2025 HSC 33

A used car has a sale price of \$24 200. In addition to the sale price, the following costs are charged:

- transfer of registration \$50
- stamp duty which is calculated at \$3 for every \$100, or part thereof, of the sale price.

Kat borrows the total amount to be paid for the car, including transfer of registration and stamp duty. Simple interest at the rate of 6.8% per annum is charged on the loan. The loan is to be repaid in equal monthly repayments over 3 years.

Calculate Kat's monthly repayment. (5 marks)

[illegible]

18. Financial Maths, STD2 F4 2005 HSC 26a

A sports car worth \$150 000 is bought in December 2005.

In December each year, beginning in 2006, the value of the sports car is depreciated by 10% using the declining balance method of depreciation.

In which year will the depreciated value first fall below \$120 000? (2 marks)

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19. Financial Maths, STD2 F4 2006 HSC 27c

Kai purchased a new car for \$30 000. It depreciated in value by \$2000 per year for the first three years.

After the end of the third year, Kai changed the method of depreciation to the declining balance method at the rate of 25% per annum.

a. Calculate the value of the car at the end of the third year. (1 mark)

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b. Calculate the value of the car seven years after it was purchased. (2 marks)

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c. Without further calculations, sketch a graph to show the value of the car over the seven years. Use the horizontal axis to represent time and the vertical axis to represent the value of the car. (3 marks)

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20. Financial Maths, STD2 F5 2017 HSC 27c

A table of future value interest factors for an annuity of \$1 is shown.

Table of future value interest factors					
Period	Interest rate per period				
	1%	2%	3%	4%	5%
3	3.0301	3.0604	3.0909	3.1216	3.1525
4	4.0604	4.1216	4.1836	4.2465	4.3101
5	5.1010	5.2040	5.3091	5.4163	5.5256
6	6.1520	6.3081	6.4684	6.6330	6.8019

An annuity involves contributions of \$12 000 per annum for 5 years. The interest rate is 4% per annum, compounded annually.

i. Calculate the future value of this annuity. (1 mark)

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ii. Calculate the interest earned on this annuity. (1 mark)

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21. Financial Maths, STD2 F4 2021 HSC 26

Nina plans to invest \$35 000 for 1 year. She is offered two different investment options.

Option A: Interest is paid at 6% per annum compounded monthly.

Option B: Interest is paid at r % per annum simple interest.

a. Calculate the future value of Nina's investment after 1 year if she chooses Option A. (2 marks)

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b. Find the value of r in Option B that would give Nina the same future value after 1 year as for Option A. Give your answer correct to two decimal places. (2 marks)

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22. Financial Maths, STD2 F5 2020 HSC 34

Tina inherits \$60 000 and invests it in an account earning interest at a rate of 0.5% per month. Each month, immediately after the interest has been paid, Tina withdraws \$800.

The amount in the account immediately after the n th withdrawal can be determined using the recurrence relation

$$A_n = A_{n-1}(1.005) - 800,$$

where $n = 1, 2, 3, \dots$ and $A_0 = 60\,000$

- a. Use the recurrence relation to find the amount of money in the account immediately after the third withdrawal. (2 marks)

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- b. Calculate the amount of interest earned in the first three months. (2 marks)

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23. Financial Maths, STD2 F4 2014 HSC 30a

Chandra and Sascha plan to have \$20 000 in an investment account in 15 years time for their grandchild’s university fees.

The interest rate for the investment account will be fixed at 3% per annum compounded monthly.

Calculate the amount that they will need to deposit into the account now in order to achieve their plan. (3 marks)

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24. Financial Maths, STD2 F4 2010 HSC 25b

William wants to buy a car. He takes out a loan for \$28 000 at 7% per annum interest for four years.

Monthly repayments for loans at different interest rates are shown in the spreadsheet.

	A	B	C	D	E
1		Monthly repayments			
2		Term of loan (in months)			48
3					
4	Amount	Interest rate p.a.			
5	borrowed	6%	7%	8%	9%
6	\$27 000	\$634.10	\$646.55	\$659.15	\$671.90
7	\$27 500	\$645.84	\$658.52	\$671.36	\$684.34
8	\$28 000	\$657.58	\$670.49	\$683.56	\$696.78
9	\$28 500	\$669.32	\$682.47	\$695.77	\$709.22
10	\$29 000	\$681.07	\$694.44	\$707.97	\$721.67
11	\$29 500	\$692.81	\$706.41	\$720.18	\$734.11
12	\$30 000	\$704.55	\$718.39	\$732.39	\$746.55

How much interest does William pay over the term of this loan? (2 marks)

25. Financial Maths, STD2 F4 2012* HSC 26c

Heather used her credit card to purchase a plane ticket valued at \$1990 on 28 January 2011. She made no other purchases on her credit card account in January. She paid the January account in full on 19 February 2011.

The credit card account has no interest free period. Compound interest is charged daily at the rate of 21.9% per annum, including the date of purchase and the date the account is paid.

How much interest did she pay, to the nearest cent? (2 marks)

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26. Financial Maths, STD2 F5 2016 HSC 28d

The table gives the contribution per period for an annuity with a future value of \$1 at different interest rates and different periods of time.

Number of periods	Interest rate (% per period)					
	0.25%	0.5%	0.75%	1%	1.25%	1.5%
6	0.1656	0.1646	0.1636	0.1625	0.1615	0.1605
12	0.0822	0.0811	0.0800	0.0788	0.0778	0.0767
18	0.0544	0.0532	0.0521	0.0510	0.0499	0.0488
24	0.0405	0.0393	0.0382	0.0371	0.0360	0.0349
30	0.0321	0.0310	0.0298	0.0287	0.0277	0.0266
36	0.0266	0.0254	0.0243	0.0232	0.0222	0.0212

Margaret needs to save \$75 000 over 6 years for a deposit on a new apartment. She makes regular quarterly contributions into an investment account which pays interest at 3% pa.

How much will Margaret need to contribute each quarter to reach her savings goal? (2 marks)

27. Financial Maths, STD2 F4 2021 HSC 30

Ariana owns 1500 shares in a company. The market price for each share is \$27. Ariana's total dividend from these shares is \$810.

Calculate the dividend yield for her shares. (2 marks)

28. Financial Maths, STD2 F4 2023 HSC 32

Ali has a credit card which has no interest-free period. Interest is charged at 13.5% per annum, compounding daily, on the amount owing.

During the month, Ali made only one purchase of \$450 using the credit card. The full amount owing was repaid 21 days later.

a. Calculate the amount of interest charged on the purchase, assuming that interest is charged for the 21 days. (2 marks)

b. What percentage of the full amount repaid is the interest? Give the answer to two decimal places. (2 marks)

29. Financial Maths, STD2 F5 2019 HSC 42

The table shows the future values of an annuity of \$1 for different interest rates for 4, 5 and 6 years. The contributions are made at the end of each year.

Future value of an annuity of \$1				
Years	Interest rate per annum			
	1%	2%	3%	4%
4	4.060	4.122	4.184	4.246
5	5.101	5.204	5.309	5.416
6	6.152	6.308	6.468	6.633

An annuity account is opened and contributions of \$2000 are made at the end of each year for 7 years.

For the first 6 years, the interest rate is 4% per annum, compounding annually.

For the 7th year, the interest rate increases to 5% per annum, compounding annually.

Calculate the amount in the account immediately after the 7th contribution is made. (3 marks)

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30. Financial Maths, STD2 F5 2021 HSC 31

Present value interest factors for an annuity of \$1 for various interest rates (r) and numbers of periods (N) are given in the table.

Table of present value interest factors				
$N \backslash r$	Interest rate per period as a decimal			
	0.001	0.00125	0.0015	0.00175
300	259.07072	250.03980	241.43789	233.24180
330	280.95771	270.26900	260.13532	250.52386
360	302.19816	289.75411	278.01062	266.92278

A bank lends Martina \$500 000 to purchase a home, with interest charged at 1.5% per annum compounding monthly. She agrees to repay the loan by making equal monthly repayments over a 30-year period.

How much should the monthly payment be in order to pay off the loan in 30 years?

Give your answer correct to the nearest cent. (2 marks)

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Calculate the minimum sum that Phoenix could have deposited in order to make these withdrawals. (4 marks)

33. Financial Maths, STD2 F4 2013 HSC 28d

Adhele has 2000 shares. The current share price is \$1.50 per share. Adhele is paid a dividend of \$0.30 per share.

- a. What is the current value of her shares? (1 mark)
- b. Calculate the dividend yield. (1 mark)

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34. Financial Maths, STD2 F4 2022 HSC 36

Frankie borrows \$200 000 from a bank. The loan is to be repaid over 23 years at a rate of 7.2% per annum, compounded monthly. The repayments have been set at \$1485 per month.

The interest charged and the balance owing for the first three months of the loan are shown in the spreadsheet below.

Month	Principal (at start of month)	Interest charged	Monthly repayment	Balance (at end of month)
1	\$200 000	\$1200	\$1485	\$199 715
2	\$199 715	<i>A</i>	\$1485	\$199 428.29
3	\$199 428.29	\$1196.57	\$1485	<i>B</i>

- a. What are the values of *A* and *B*? (2 marks)

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- b. After 50 months of repaying the loan, Frankie decides to make a lump sum payment of \$ 40 000 and to continue making the monthly repayments of \$1485. The loan will then be fully repaid after a further 146 monthly repayments.

How much less will Frankie pay overall by making the lump sum payment? (3 marks)

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35. Financial Maths, STD2 F4 2023 HSC 29

The table shows monthly repayments for each \$1000 borrowed.

Monthly repayment table

Principal and Interest per \$1000 borrowed						
Interest rate (per annum)	Term of loan (years)					
	5	10	15	20	25	30
6.5%	19.57	11.35	8.71	7.46	6.75	6.32
7.0%	19.80	11.61	8.99	7.75	7.07	6.65
7.5%	20.04	11.87	9.27	8.06	7.39	6.99
8.0%	20.28	12.13	9.56	8.36	7.72	7.34

- a. A couple borrows \$520 000 to buy a house at 8% per annum over 25 years.

How much does the couple repay in total for this loan? (3 marks)

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- b. Chris borrows some money at 7% per annum. Chris will repay the loan over 15 years, paying \$3596 per month.

How much money does Chris borrow? (1 mark)

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Worked Solutions

1. Financial Maths, STD2 F4 2021 HSC 4 MC

$$\begin{aligned}
 S &= V_0(1 - r)^n \\
 &= 2467(1 - 0.15)^3 \\
 &= 2467(0.85)^3 \\
 &= 1515.046... \approx \$1515
 \end{aligned}$$

$\Rightarrow D$

2. Financial Maths, STD2 F4 2012 HSC 16 MC

By Elimination

B and D represent straight line depreciation.

C incorrectly has no salvage value after 10 years

$\Rightarrow A$

3. Financial Maths, STD2 F4 2012 HSC 24 MC

Monthly repayment = \$2796.86

Repayments = $30 \times 12 = 360$

Total repaid = $360 \times 2796.86 = \$1\,006\,869.60$

Total interest = $1\,006\,869.60 - 400\,000 = \$606\,869.60$

Fortnightly payment = \$1404.76

Repayments = $23 \times 26 = 598$

Total repaid = $598 \times 1404.76 = \$840\,046.48$

Total interest = $840\,046.48 - 400\,000 = \$440\,046.48$

$\therefore$ Difference in interest = $606\,869.60 - 440\,046.48 = \$166\,823$ (nearest dollar)

$\Rightarrow B$

4. Financial Maths, STD2 F4 2019 HSC 13 MC

Values increase quicker

- higher compounding interest rate
- same rate but more frequent compounding period

$\therefore W = 10\%$ quarterly

$X = 10\%$ annually

$Y = 5\%$ annually

$\Rightarrow C$

5. Financial Maths, STD2 F4 2024 GEN1 21 MC

Repayments = $2228.40 \times 12 \times 5 = \$133\,704$

Interest = $133\,704 - 121\,000 = \$12\,704$

$\Rightarrow D$

6. Financial Maths, STD2 F4 2024 HSC 7 MC

$r = 2.5\% = \frac{2.5}{100} = 0.025$

$FV = PV(1 + r)^n$

$= 180(1.025)^3$

$= 193.84$

$\Rightarrow D$

7. Financial Maths, STD2 F1 2017 HSC 11 MC

Net Depreciation = $19\,900 - 16\,300 = \$3600$

$\therefore \% \text{ Depreciation} = \frac{3600}{19\,900} \times 100 = 18.09\dots\%$

$\Rightarrow A$

8. Financial Maths, STD2 F5 2014 HSC 21 MC

4 contributions of \$25 000 made.

Annuity period = 6 months

$$\text{Rate (per annuity period)} = \frac{4\%}{2} = 2\%$$

No. Periods = 4 (4 x 6 months = 2 years)

Table value = 4.1216

$$\therefore \text{Annuity Value} = 4.1216 \times 25\,000 = \$103\,040$$

$\Rightarrow C$

9. Financial Maths, STD2 F4 2018 HSC 19 MC

4% annual

$$\Rightarrow \frac{4\%}{4} = 1\% \text{ compounded quarterly}$$

$$\Rightarrow n = 8$$

$$\Rightarrow \text{Factor} = 1.0829$$

$$\therefore \text{Minimum sum} = 21\,000 \div 1.0829$$

$\Rightarrow D$

10. Financial Maths, STD2 F5 2020 HSC 14 MC

Mean mark 53%.

PV (30 June 2020) < \$10 000 (each payment discounted to 30-Jun-20 value)

FV (30 June 2030) $\Rightarrow$ annuity has received $10 \times \$1000$

payments plus interest

$\therefore FV$ (30 June 2030) > \$10 000

$\Rightarrow A$

11. Financial Maths, STD2 F4 2020 HSC 11 MC

$$V_0 = 10\,000, r = 0.08, n = 10$$

$$\begin{aligned} S &= V_0(1 - r)^n \\ &= 10\,000(1 - 0.08)^{10} \\ &= 10\,000(0.92)^{10} \\ &= \$4343.884\dots \approx \$4343.88 \end{aligned}$$

$\Rightarrow C$

♦ Mean mark 43%.

COMMENT: 8% depreciation is applicable every 6 months here ($n=10$). Read carefully!

12. Financial Maths, STD2 F5 2013 23 MC

Interest: 3% p.a $\Rightarrow$ 1.5% per 6 months

After 2 years,

$$\text{Value of 1st deposit} = 1200(1.015)^3 = 1254.81$$

$$\text{Value of 2nd deposit} = 1200(1.015)^2 = 1236.27$$

$$\text{Value of 3rd deposit} = 1200(1.015) = 1218$$

$$\text{Value of 4th deposit} = 1200$$

$\therefore$ Amount in account after 2 years

$$= 1254.81 + 1236.27 + 1218 + 1200$$

$$= \$4909.08$$

$\Rightarrow A$

♦ Mean mark 41%.

13. Financial Maths, STD2 F4 2010* HSC 22 MC

$$\text{Days of interest } (n) = 2 + 23 = 25$$

$$\text{Daily interest rate } (r) = \frac{0.0521}{100} = 0.000521$$

♦♦♦ Mean mark 20%. Lowest scoring MC question in the 2010 exam.

$$\begin{aligned}\text{Closing Balance } (FV) &= PV(1 + r)^n \\ &= 1721.50(1.000521)^{25} = \$1744.06\end{aligned}$$

$$5\% \text{ of closing balance} = \frac{5}{100} \times 1744.06 = 87.20 \text{ (nearest cent)}$$

Since $\$87.20 > \25 , minimum payment = \$87.20

$\Rightarrow D$

14. Financial Maths, STD2 F4 2015 HSC 26d

$$\begin{aligned}FV &= PV(1 + r)^n \\ &= 320(1.029)^5 \\ &= \$369.1703 \dots = \$369.17 \text{ (nearest cent)}\end{aligned}$$

15. Financial Maths, STD2 F4 2019 HSC 21

$$\text{Value of shares} = 1526 \times 8.75 = \$13\,352.50$$

$$\therefore \text{Dividend yield} = \frac{1068.20}{13\,352.50} = 0.08 = 8\%$$

16. Financial Maths, STD2 F4 2025 HSC 23

$$\text{Div yield (A)} = \frac{4.92}{25.43} = 0.1934 = 19.3\%$$

$$\text{Div yield (B)} = \frac{0.45}{2.13} = 0.211 = 21.1\%$$

Since Div yield (B) > Div yield (A), it is better to invest in company B.

17. Financial Maths, STD2 F4 2025 HSC 33

$$\text{Stamp Duty} = \frac{24\,200}{100} \times 3 = \$726$$

$$\begin{aligned}\text{Total Cost} &= \text{Price} + \text{Transfer} + \text{Stamp Duty} \\ &= 24\,200 + 50 + 726 = \$24\,976\end{aligned}$$

$$\text{Interest} = Prn = 24\,976 \times 0.068 \times 3 = \$5095.104$$

$$\begin{aligned}\text{Loan amount} &= \text{Total Cost} + \text{Interest} \\ &= 24\,976 + 5095.104 = \$30\,071.104\end{aligned}$$

$$3 \text{ years} = 3 \times 12 = 36 \text{ months}$$

$$\begin{aligned}\text{Monthly repayment} &= \frac{30\,071.104}{36} \\ &= \$835.308444 \approx \$835.31\end{aligned}$$

18. Financial Maths, STD2 F4 2005 HSC 26a

$$\text{Using } S = V_0(1 - r)^n$$

$$\text{where } V_0 = 150\,000, r = 10\%$$

$$\text{If } n = 2,$$

$$S = 150\,000(1 - 0.1)^2 = \$121\,500$$

$$\text{If } n = 3,$$

$$S = 150\,000(1 - 0.1)^3 = \$109\,350$$

$\therefore$ The value falls below \$120 000 in the third year
which will be during 2008.

19. Financial Maths, STD2 F4 2006 HSC 27c

- a. Using $S = V_0 - Dn$

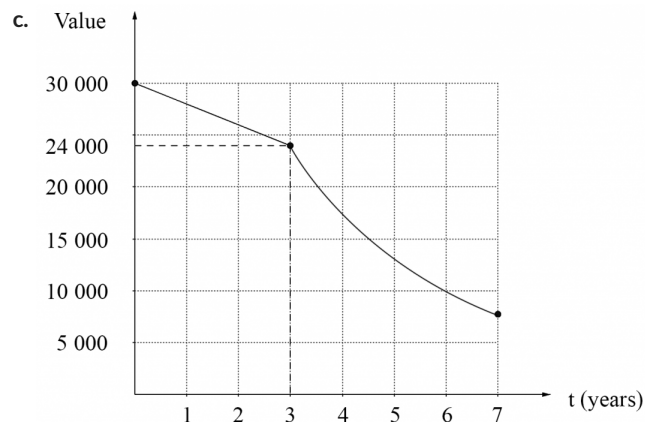
$$S = 30\,000 - (2000 \times 3) = \$24\,000$$

- b. Using $S = V_0(1 - r)^n$

$$\text{where } V_0 = 24\,000, r = 0.25, n = 4$$

$$S = 24\,000(1 - 0.25)^4 = \$7593.75$$

$\therefore$ The value of the car after 7 years is \$7593.75



20. Financial Maths, STD2 F5 2017 HSC 27c

- i. FV factor = 5.4163

$$\therefore FV \text{ of Annuity} = 12\,000 \times 5.4163 = \$64\,995.60$$

- ii. Interest earned = FV - total repayments

$$= 64\,995.60 - (5 \times 12\,000) = \$4995.60$$

♦♦ Mean mark part (ii) 22%.

COMMENT: A very poorly answered question dealing with a core concept in this area.

21. Financial Maths, STD2 F4 2021 HSC 26

- a. $r = \frac{6\%}{12} = 0.5\% = 0.005$ per month

$$n = 12$$

$$\begin{aligned} FV &= PV(1 + r)^n \\ &= 35\,000(1 + 0.005)^{12} \\ &= \$37\,158.72 \end{aligned}$$

- b. $I = Prn$

$$2158.72 = 35\,000 \times r \times 1$$

$$\begin{aligned} r &= \frac{2158.72}{35\,000} = 0.06167\dots \\ &= 6.17\% \text{ (to 2 d.p.)} \end{aligned}$$

♦♦ Mean mark part (b) 36%.

22. Financial Maths, STD2 F5 2020 HSC 34

- a. $A_1 = 60\,000(1.005) - 800 = \$59\,500$

$$A_2 = 59\,500(1.005) - 800 = \$58\,997.50$$

$$A_3 = 58\,997.50(1.005) - 800 = \$58\,492.49$$

♦ Mean mark part (a) 41%.

- b. Amount (not interest)

$$= 60\,000 - (3 \times 800)$$

$$= \$57\,600$$

♦♦ Mean mark part (b) 33%.

$\therefore$ Interest earned in 3 months

$$= A_3 - 57\,600$$

$$= 58\,492.49 - 57\,600$$

$$= \$892.49$$

23. Financial Maths, STD2 F4 2014 HSC 30a

$$FV = \$20\,000, \quad n = 15 \times 12 = 180,$$

$$r = \frac{0.03}{12} = 0.0025$$

$$FV = PV(1 + r)^n$$

$$20\,000 = PV(1 + 0.0025)^{180}$$

$$PV = \frac{20\,000}{(1.0025)^{180}}$$

$$= \$12\,759.73\dots$$

$\therefore$ They need to deposit \$12 760 (nearest \$)

♦ Mean mark 49%

24. Financial Maths, STD2 F4 2010 HSC 25b

$$\text{Loan} = \$28\,000, \quad r = 7\% \text{ p.a.}$$

$$\text{Monthly repayment} = \$670.49$$

$$\# \text{ Repayments} = 4 \times 12 = 48$$

$$\text{Total repaid} = 48 \times 670.49 = \$32\,183.52$$

$$\begin{aligned} \therefore \text{Interest paid} &= 32\,183.52 - 28\,000 \\ &= \$4183.52 \end{aligned}$$

♦ Mean mark 42%

MARKER'S COMMENT: An incorrect table value used correctly in the following calculations received half-marks here. *Show your working!*

25. Financial Maths, STD2 F4 2012* HSC 26c

$$\text{Days of interest } (n) = 4 + 19 = 23$$

$$\text{Daily interest rate } (r) = \frac{0.219}{365} = 0.0006$$

$$\begin{aligned} \text{Total Paid } (FV) &= PV(1 + r)^n \\ &= 1990(1.0006)^{23} \\ &= 2017.644\dots = \$2017.64 \end{aligned}$$

$$\therefore \text{Interest Paid} = 2017.64 - 1990 = \$27.64$$

♦ Mean mark 38%

MARKER'S COMMENT: Too many students calculated the # days as 22 instead of 23!

26. Financial Maths, STD2 F5 2016 HSC 28d

$$\text{Periods} = 6 \times 4 = 24$$

$$\text{Interest rate} = \frac{1}{4} \times 3 = 0.75\%$$

$$\Rightarrow \text{Table factor} = 0.0382$$

(i.e. 3.82 cents contributed per
quarter = \$1 after 6 years)

$$\begin{aligned} \therefore \text{Quarterly contribution} \\ &= 75\,000 \times 0.0382 = \$2865 \end{aligned}$$

♦ Mean mark 40%.

27. Financial Maths, STD2 F4 2021 HSC 30

$$\begin{aligned} \text{Dividend yield} &= \frac{\text{Dividend}}{\text{Value of shares}} \\ &= \frac{810}{1500 \times 27} \\ &= 0.02 = 2\% \text{ yield} \end{aligned}$$

♦ Mean mark 47%.

28. Financial Maths, STD2 F4 2023 HSC 32

a. Daily interest rate $(r) = \frac{13.5}{365} \% = \frac{0.135}{365}$ ♦ Mean mark (a) 45%.

$$n = 21 \text{ days}$$

$$\begin{aligned} FV &= PV(1 + r)^n \\ &= 450 \left(1 + \frac{0.135}{365} \right)^{21} = \$453.51 \end{aligned}$$

$$\therefore \text{Interest charged} = 453.51 - 450 = \$3.51$$

b. Interest as % total repaid $= \frac{3.51}{453.51} \times 100$ ♦ Mean mark (b) 49%.

$$\begin{aligned} &= 0.007739 \dots \\ &= 0.77 \% \text{ (to 2 d.p.)} \end{aligned}$$

29. Financial Maths, STD2 F5 2019 HSC 42

$$\text{Annuity compounding factor (4\% for 6 years)} = 6.633$$

$$\therefore \text{Value after 6 years} = 2000 \times 6.633 = \$13\,266.00$$
 ♦♦ Mean mark 27%.

At the end of 7th year:

$$\begin{aligned} \text{Value} &= 13\,266 \times 1.05 + 2000 \\ &= 13\,929.30 + 2000 = \$15\,929.30 \end{aligned}$$

30. Financial Maths, STD2 F5 2021 HSC 31

$$\text{Monthly interest rate } (r) = \frac{1.5}{12} = 0.125\% = 0.00125$$

$$N = 30 \times 12 = 360$$

$$\Rightarrow \text{PV annuity factor} = 289.75411$$

$$\therefore \text{Monthly payment} = \frac{500\,000}{289.75411} = \$1725.60$$
 ♦ Mean mark 43%.

31. Financial Maths, STD2 F5 2021 HSC 40

In 1st 8 years:

$$\text{Future value factor} = 8.2132$$

$$\text{Value of annuity} = 8.2132 \times 1000 = \$8213.20$$
 ♦ Mean mark 35%.

After 10 years:

$$\text{Value of investment} = 8213.2 \times (1.0125)^2 = \$8419.81$$

32. Financial Maths, STD2 F5 2024 HSC 41

1st Annuity

♦♦ Mean mark 39%.

Find PVA for \$2000 paid monthly for 1st 15 years:

$$r = \frac{2.4}{12} = 0.2\% = 0.002$$

$$\text{Total payments (to Phoenix)} = 15 \times 12 = 180$$

$$\text{PVA factor (from table)} = 151.036$$

$$\text{PVA (1st annuity)} = 2000 \times 151.036 = \$302\,072$$

2nd Annuity

Find PVA for \$1200 paid monthly from year 16 to 25:

$$\text{PVA (2nd annuity)} = \text{PVA (25 years)} - \text{PVA (15 years)}$$

$$r = \frac{2.4}{12} = 0.2\% = 0.002$$

$$\text{Total payments (25 years)} = 25 \times 12 = 300$$

$$\text{PVA factors (from table): } 225.430 \text{ (25 years), } 151.036 \text{ (15 years)}$$

$$\begin{aligned} \text{PVA (2nd annuity)} &= (1200 \times 225.430) - (1200 \times 151.036) \\ &= \$89\,272.80 \end{aligned}$$

$$\therefore \text{Minimum deposit} = 302\,072 + 89\,272.80 = \$391\,344.80$$

33. Financial Maths, STD2 F4 2013 HSC 28d

- a. # Shares = 2000

$$\text{Share price} = \$1.50$$

$$\therefore \text{Current value} = 2000 \times 1.50 = \$3000$$

b. Dividend yield = $\frac{\text{Dividend}}{\text{Share price}}$

$$= \frac{0.30}{1.50} = 20\%$$

◆◆◆ Mean mark (b) 13%

MARKER'S COMMENT: A large majority of students had a poor understanding of the term dividend yield.

34. Financial Maths, STD2 F4 2022 HSC 36

a. Monthly interest rate = $\frac{7.2}{12} = 0.6\%$

$$A = 199\,715 \times \frac{0.6}{100} = \$1198.29$$

$$B = P + I - R$$

$$= 199\,428.29 + 1196.57 - 1485 = \$199\,139.86$$

- b. Total payments if lump sum not paid

$$= (23 \times 12) \times 1485 = \$409\,860$$

◆◆◆ Mean mark (b) 17%.

Total payments if lump sum paid

$$= 40\,000 + (50 + 146) \times 1485 = \$331\,060$$

Savings by paying the lump sum

$$= 409\,860 - 331\,060 = \$78\,800$$

35. Financial Maths, STD2 F4 2023 HSC 29

- a. 8.0% interest over a 25 year loan

◆ Mean mark (a) 50%.

$$\text{Monthly repayments to borrow } \$1000 = \$7.72$$

$$\text{Total months} = 25 \times 12 = 300$$

$$\text{Monthly repayments} = 520 \times 7.72 = \$4014.40$$

$$\therefore \text{Total repayments} = 4014.40 \times 300 = \$1\,204\,320$$

- b. 7.0% interest over a 15 year loan

◆◆◆ Mean mark (b) 11%.

$$\text{Monthly repayments to borrow } \$1000 = \$8.99$$

$$\therefore \text{Amount borrowed} = \frac{3596}{8.99} \times 1000 = \$400\,000$$