

WA8MNAF1

Financial mathematics

Core + Challenge

Interest, Fees and Penalties — Marking Key

I can calculate interest on unpaid credit card balances, late and missed-payment fees, and compare the total cost of borrowing.

For tutors and parents. Award method marks for correct working even if the final answer is wrong.

Marks summary

Section A Fluency: 16 Section B Core: 22 Section C Reasoning: 9 Section D Challenge: 11 **Total: 58**

Fluency: 1 mark each; accept an equivalent unsimplified answer for half credit at tutor's discretion.

A Fluency *answers and working*

/ 16 marks

Q	Answer	Working
1	\$12	800×0.015
2	\$7	350×0.02
3	1.5% per month	$18 \div 12$
4	1.75% per month	$21 \div 12$
5	\$21	1200×0.0175
6	\$31.40	$25 + 6.40$
7	\$60	$660 - 600$
8	\$360	$2360 - 2000$
9	18%	$\frac{360}{2000} \times 100\%$
10	\$30	3×10
11	\$440	$640 - 200$
12	\$8.80	440×0.02
13	\$45	1500×0.03
14	1.5% per month	$\frac{15}{1000} \times 100\%$
15	\$8.25	$99 \div 12$
16	\$60	$400 \times 0.05 \times 3$

B

Core *answers, working and marks*

/ 22 marks

Q	Answer	Working / sample response	Marks
1	(a) \$37 (b) \$1813; \$29.01	(a) $1850 \times 0.02 = \$37$ (more than \$25) (b) $1850 - 37 = \$1813$ $1813 \times 0.016 = 29.008 \approx \$29.01$ <i>1 mark: \$37</i> <i>1 mark: \$1813</i> <i>1 mark: \$29.01</i>	3
2	\$102.72	Interest: $86 \times 0.02 = \$1.72$ $86 + 15 + 1.72 = \$102.72$ <i>1 mark: \$1.72</i> <i>1 mark: \$102.72</i>	2
3	\$377; 4.7%	Fees $10 + 7 = \$17$; total $360 + 17 = \$377$ $\frac{17}{360} \times 100\% = 4.72\ldots\% \approx 4.7\%$ <i>1 mark: \$377</i> <i>1 mark: 4.7%</i>	2
4	A \$1920 (\$120 extra); B \$1926 (\$126 extra); A by \$6	A: $24 \times 80 = \$1920$; cost $1920 - 1800 = \$120$ B: $12 \times 158 + 30 = \$1926$; cost \$126 A is cheaper by \$6 <i>1 mark: A</i> <i>1 mark: B</i> <i>1 mark: A by \$6</i>	3
5	Fees \$128; total \$528	Establishment: $400 \times 0.2 = \$80$; monthly: $400 \times 0.04 \times 3 = \$48$ Fees \$128; total $400 + 128 = \$528$ <i>1 mark: \$128</i> <i>1 mark: \$528</i>	2
6	\$2060.45	Month 1: $2000 \times 1.015 = \$2030$ Month 2: $2030 \times 1.015 = \$2060.45$ <i>1 mark: \$2030</i> <i>1 mark: \$2060.45</i>	2
7	\$3360; \$320 per month	$12\ 000 \times 0.07 \times 4 = \$3360$ $(12\ 000 + 3360) \div 48 = \$320$ <i>1 mark: \$3360</i> <i>1 mark: \$320</i>	2
8	\$1859.40	Fees: $12 \times 4.95 = \$59.40$ $1800 + 59.40 = \$1859.40$ <i>1 mark: \$59.40</i> <i>1 mark: \$1859.40</i>	2
9	\$985; only \$15	$1000 \times 1.015 = 1015$; $1015 - 30 = \$985$ $1000 - 985 = \$15$ (half of his payment was interest) <i>1 mark: \$985</i> <i>1 mark: \$15</i>	2

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Q	Answer	Working / sample response	Marks
10	Card X, by \$19	X: $500 \times 0.2099 = \\$104.95$ Y: $59 + 500 \times 0.1299 = 59 + 64.95 = \\$123.95$; X is cheaper by \$19 <i>1 mark: both costs</i> <i>1 mark: X by \$19</i>	2

C

Reasoning *sample answers and marking criteria*

/ 9 marks

Q	Answer	Working / sample response	Marks
1	Interest keeps building	Interest is charged on the unpaid balance every month. Much of each minimum payment is used up by interest, so the debt falls very slowly and costs a lot more overall. <i>1 mark: interest on unpaid balance</i> <i>1 mark: debt falls slowly / costs more</i>	2
2	False	It is only interest-free if the whole balance is paid by the due date. Otherwise interest is charged, and there may be annual fees, late fees or surcharges. <i>1 mark: false</i> <i>1 mark: condition or fees</i>	2
3	\$9	18% is the yearly rate; the monthly rate is $18 \div 12 = 1.5\%$. $600 \times 0.015 = \\$9$ <i>1 mark: identifies yearly rate</i> <i>1 mark: \$9</i>	2
4	Merchant fees and late fees	Shops pay the BNPL company a fee (a percentage) on every sale. Customers who pay late are charged late or missed-payment fees. Some also charge account or set-up fees; people may buy more, increasing sales. <i>1 mark: merchant fees</i> <i>1 mark: late fees</i> <i>1 mark: clear explanation</i>	3

D

Challenge *solutions and marking criteria*

/ 11 marks

Q	Answer	Working / sample response	Marks
1	\$212.14; interest \$12.14	Month 1: $900 - 300 = 600$; interest $\\$9 \rightarrow \\$609$ Month 2: $609 - 400 = 209$; interest $209 \times 0.015 = 3.135 \approx \\$3.14 \rightarrow \\$212.14$ Total interest $9 + 3.14 = \\$12.14$ <i>1 mark: \$609</i> <i>1 mark: \$212.14</i> <i>1 mark: \$12.14</i>	3

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Q	Answer	Working / sample response	Marks
2	\$954.33; only \$45.67	Month 1: $1000 + 15.00 - 30 = 985.00$ Month 2: $985 + 14.78 - 30 = 969.78$; Month 3: $969.78 + 14.55 - 30 = 954.33$ Debt fell by $1000 - 954.33 = \\$45.67$ (the other \$44.33 was interest) <i>1 mark: \$985 and \$969.78</i> <i>1 mark: \$954.33</i> <i>1 mark: \$45.67</i>	3
3	12.5%; 650% per year	$\frac{15}{120} \times 100\% = 12.5\%$ for one week $12.5\% \times 52 = 650\%$ per year <i>1 mark: 12.5%</i> <i>1 mark: 650%</i>	2
4	A \$168.05; B \$420; A by \$251.95	A: interest $45.00 + 38.18 + 31.25 + 24.22 + 17.08 + 9.84 + 2.48 = \\$168.05$ (7 payments, last \$168.05) B: $3000 \times 0.09 + 150 = 270 + 150 = \\$420$ A is cheaper by $420 - 168.05 = \\$251.95$ <i>1 mark: A \$168.05</i> <i>1 mark: B \$420</i> <i>1 mark: A by \$251.95</i>	3