Chapter 2: Financial Mathematics: Borrowing Money

Lesson 2.1: Analyzing Loans, page 92

1. a) $A = P(1 + rt)$

$A = 2500(1 + (0.024)(1))$

$A = 2560$

Alex needed to pay back $2560.

b) $I = A - P$

$I = 2560 - 2500$

$I = 60$

Alex needed to pay $60 in interest.

2. a) $A = P(1+i)^n$

$$A = 1200\left(1+\frac{0.112}{12}\right)^6$$

$$A = 1200(1.009...)^6$$

$$A = 1200(1.057...)$$

$$A = 1268.787...$$

Holly needed to pay back $1268.79.

b) $I = A - P$

$I = 1268.79 - 1200$

$I = 68.79$

Holly needed to pay $68.79 in interest.

3. a) $P = \frac{A}{(1+i)^n}$

$$P = \frac{12\,000}{\left(1+\frac{0.049}{4}\right)^6}$$

$$P = \frac{12\,000}{(1+0.012\,25)^6}$$

$$P = \frac{12\,000}{(1.012\,25)^6}$$

$$P = \frac{12\,000}{1.075...}$$

$$P = 11\,154.613...$$

Matt can borrow at most $11 154.61.

b) $I = A - P$

$I = 12\,000 - 11\,154.61$

$I = 845.39$

Matt will pay $845.39 in interest.

4. a) e.g., I made a spreadsheet to determine how long David will have to make payments.

Payment Period (month)	Payment ($)	Interest Paid ($)	Principal Paid ($)	Balance ($)
0				–6583
1	250	68.02433	181.97566	–6401.02433
2	250	66.14391	183.85608	–6217.16825
29	250	7.32535	242.67464	–466.23055
30	250	4.81771	245.18228	–221.04827
31	250	2.28416	247.71583	26.66756

David will need to make payments for 31 months.

b) To determine the interest paid, determine the total amount David paid: $31 \cdot \$250 = \$7750$.

I = Total paid – P

$I = (7750 - 26.67) - 6583$

$I = 1140.33$

David will need to pay about $1140.33 in interest.

5. a) $A = P(1+i)^n$

$$A = 14\,000\left(1+\frac{0.075}{4}\right)^{16}$$

$$A = 14\,000(1.01875)^{16}$$

$$A = 18\,845.600...$$

Perry will need to pay $18 845.60.

b) i) More. e.g., He is borrowing the money for a longer period of time, so he will pay more interest.

$A = P(1+i)^n$

$$A = 14\,000\left(1+\frac{0.075}{4}\right)^{32}$$

$$A = 14\,000(1.01875)^{32}$$

$$A = 25\,368.333...$$

Difference = 25 368.333… – 18 845.600…

Difference = 6522.732

He will pay $6522.73 more.

ii) Less. e.g., he is borrowing money for a shorter period of time, so he will pay less interest.

$A = P(1+i)^n$

$$A = 14\,000\left(1+\frac{0.075}{4}\right)^{8}$$

$$A = 14\,000(1.01875)^{8}$$

$$A = 16\,243.103...$$

Difference = 18 845.600… – 16 243.103…

Difference = 2602.497…

He will pay $2602.50 less.

6. a) $P = \dfrac{A}{(1+i)^n}$

$$P = \frac{12\,000}{\left(1+\frac{0.056}{12}\right)^{12}}$$

$$P = \frac{12\,000}{(1.004...)^{12}}$$

$$P = 11\,347.947...$$

Louis can borrow at most $11 347.95.

b) $I = A - P$

$I = 12\ 000 - 11.347.95$

$I = 652.05$

Louis will pay $652.05 in interest.

7. a) Since the mortgage is covering 90% of the cost, the down payment will be 10% of the cost.
Down payment = (0.10)(179 900)
Down payment = 17 990
The down payment will be $17 990.
b) Principal = (0.90)(179 900)
Principal = 161 910
The principal of the mortgage will be $161 910.
c) The present value is $161 910.
The regular payment amount is unknown.
The payment frequency is 52 times per year.
The number of payments is (52 · 15), or 780.
The payments are made at the end of the payment periods.
The annual interest rate is 4.5%.
The compounding frequency is two times per year.
The future value is $0.
Using the financial application on a graphing calculator, the regular payment amount is $284.630… or $284.63.
d) Half the loan: $161 910 ÷ 2 = $80 955
The present value is $161 910.
The regular payment amount is $284.630….
The payment frequency is 52 times per year.
The number of payments is unknown.
The payments are made at the end of the payment periods.
The annual interest rate is 4.5%.
The compounding frequency is two times per year.
The future value is $80 955.
Using the financial application on a graphing calculator, it will take 453.909… weeks. In other words, it would take 454 weeks or 8 years 38 weeks to pay back half of the loan.
e) $I = A - P$

$I = (284.630... \cdot 780) - 161\ 910$

$I = 222\ 011.743... - 161\ 910$

$I = \$60\ 101.743...$

Sara and Sylvie will pay $60 101.74 in interest.

8. a) The present value is $15 000.
The regular payment amount is $1200.
The payment frequency is 4 times a year.
The number of payments is unknown.
The payments are made at the end of the payment periods.
The annual interest rate is 2.6%.
The compounding frequency is 4 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the number of payments is 13.079…, or 14.
It will take Lissa 42 months or 3 years 6 months to repay her investor.
b)

Payment Period	Payment ($)	Interest Paid ($)	Principal Paid ($)	Balance ($)
0				-15000
1	1200	97.5	1102.5	-13897.5
2	1200	90.33375	1109.66625	-12787.834
3	1200	83.12091938	1116.879081	-11670.955
4	1200	75.86120535	1124.138795	-10546.816
5	1200	68.55430319	1131.445697	-9415.3702
6	1200	61.19990616	1138.800094	-8276.5701
7	1200	53.79770555	1146.202294	-7130.3678
8	1200	46.34739063	1153.652609	-5976.7152
9	1200	38.84864867	1161.151351	-4815.5638
10	1200	31.30116489	1168.698835	-3646.865
11	1200	23.70462246	1176.295378	-2470.5696
12	1200	16.05870251	1183.941297	-1286.6283
13	1200	8.363084072	1191.636916	-94.991403
14	95.608847	0.617444118	94.99140284	0
	15695.6088	695.608847	15000	

Lissa will pay $695.61 in interest.

9. a) *The present value is unknown.*
The regular payment amount is $25.
The payment frequency is 52 times a year.
The number of payments is 52.
The payments are made at the end of the payment periods.
The annual interest rate is 3.8%.
The compounding frequency is 52 times a year.
The future value is $0.
Using the financial application on a graphing calculator, at most Vicky can borrow $1275.152… or $1275.15.
b) $I = A - P$

$I = (25 \cdot 52) - 1275.152...$

$I = 1300 - 1275.152...$

$I = \$24.848...$

Vicky will pay $24.85 in interest.

10. *The present value is unknown.*
The regular payment amount is $80.
The payment frequency is 52 times a year.
The number of payments is (52 · 5), or 260.
The payments are made at the end of the payment periods.
The annual interest rate is 9.5%.
The compounding frequency is 52 times a year.
The future value is $0
Using the financial application on a graphing calculator, at most Dylan can borrow $16 545.650… or $16 545.65.

11. a) The present value is 17 899 – 2000, or 15 899.
The regular payment amount is unknown.
The payment frequency is 2 times a year.
The number of payments is $(2 \cdot 4)$, or 8.
The payments are made at the end of the payment periods.
The annual interest rate is 2.1%.
The compounding frequency is 2 times a year.
The future value is $0.

Using the financial application on a graphing calculator, the payment amount is $2082.422…
Paul will need to pay $2082.42 each half year.

b)

Payment Period	Payment ($)	Interest Paid ($)	Principal Paid ($)	Balance ($)
0				-15899
1	2082.42	166.9395	1915.4805	-13983.52
2	2082.42	146.8269548	1935.593045	-12047.926
3	2082.42	126.5032278	1955.916772	-10092.01
4	2082.42	105.9661017	1976.453898	-8115.5558
5	2082.42	85.21333573	1997.206664	-6118.3491
6	2082.42	64.24266576	2018.177334	-4100.1718
7	2082.42	43.05180375	2039.368196	-2060.8036
8	2082.44203	21.63843769	2060.803589	0
	16659.382	760.3820271	15899	

Half of the loan is $15 899 ÷ 2 = $7949.50.
Half of the loan was paid off after 5 periods, or 2 years 6 months.

c) Summing the Interest Paid column: $760.38.
Paul will pay $760.38 in interest.

12. a) $A = P(1+i)^n$

$$A = 30000\left(1+\frac{0.064}{12}\right)^{60}$$

$$A = 30000(1.005...)^{60}$$

$$A = 30000(1.375...)$$

$$A = 41\,278.718...$$

$I = A - P$
$I = 41\,278.718... - 30\,000$
$I = 11\,278.718...$
Bernice will have to pay $41 278.72, with $11 278.72 being interest.

b) i) The present value is $30 000.
The regular payment amount is unknown.
The payment frequency is 12 times a year.
The number of payments is $(12 \cdot 5)$, or 60.
The payments are made at the end of the payment periods.
The annual interest rate is 6.4%.
The compounding frequency is 12 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the payment amount is $585.580…
Each payment would be $585.58.

ii) Using an amortization table:

Payment Period (month)	Payment ($)	Interest Paid ($)	Principal Paid ($)	Balance ($)
0				–30000
1	585.580…	160	425.580…	–29574.419…
2	585.580…	157.730…	427.850…	–29146.569…
3	585.580…	155.448…	430.131…	–28716.437…
4	585.580…	153.154…	432.425…	–28284.011…

12	585.580…	134.356…	451.224…	–24740.537…

After 1 year: $24 740.54

24	585.580…	104.615…	480.964…	–19134.417…

After 2 years: $19 134.42

36	585.580…	72.914…	512.665…	–13158.791…

After 3 years: $13 158.79

48	585.580…	39.124…	546.456…	–6789.305…

After 4 years: $6788.31

60	585.580…	3.106…	582.473…	0

After 5 years: $0

iii) $I = A - P$
$I = (585.580... \cdot 60) - 30\,000$
$I = 35\,134.816... - 30\,000$
$I = 5134.816...$
Bernice will pay $5134.82 in interest.

13. a) The present value of the loan:
10 000 + 1500(8) = $22 000

$A = P(1+i)^n$

$$A = 22000\left(1+\frac{0.011}{12}\right)^{20}$$

$A = 22\,406.865...$
$I = A - P$
$I = 22\,406.87 - 22\,000$
$I = 406.87$
Violet will pay $406.87 in interest.

b) i) The present value is $22 000.
The regular payment amount is $500.
The payment frequency is 12 times a year.
The number of payments is unknown.
The payments are made at the end of the payment periods.
The annual interest rate is 1.1%.
The compounding frequency is 12 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the number of payments is 44.932… .

ii) $I = A - P$

$I = (44.932...)(500) - 22\,000$

$I = 22\,466.260... - 22\,000$

$I = 466.260...$

Violet will pay $466.26 in interest and it will take 45 months to pay off the loan.

14. a) The present value is $37 478.
The regular payment amount is unknown.
The payment frequency is 12 times a year.
The number of payments is (12 · 6), or 72.
The payments are made at the end of the payment periods.
The annual interest rate is 4.5%.
The compounding frequency is 12 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the payment amount is $594.926...
Frank's monthly payments will be $594.93.
b) Using an amortization table:

Payment Period (month)	Payment ($)	Interest Paid ($)	Principal Paid ($)	Balance
0				-37478
1	594.926...	140.542...	454.384...	-37023.615...
2	594.926...	138.838...	456.088...	-36567.527...
3	594.926...	137.128...	457.798...	-36109.728...
4	594.926...	135.411...	459.515...	-35650.213...

i) 25% of 6 years is 1.5 years or 18 months.

18	594.926...	110.689...	484.236...	-29033.089...

The balance owing is $29 033.09.
ii) 50% of 6 years is 3 years or 36 months.

36	594.926...	76.940...	517.985...	-19999.609...

The balance owing is $19 999.61.
iii) 75% of 6 years is 4.5 years or 54 months.

54	594.926...	40.839...	554.087...	-10336.539...

The balance owing is $10 336.54.
iv) 100% of 6 years is 6 years or 72 months.

72	594.926...	2.222...	592.704...	0

The balance owing is $0.
c) Using an amortization table:
i) The amount of interest paid is $2263.77.
ii) The amount of interest paid is $3938.98.
iii) The amount of interest paid is $4984.59.
iv) The amount of interest paid is $5356.74.

15. a) The present value is $2152.
The regular payment amount is unknown.
The payment frequency is 12 times a year.
The number of payments is (12 · 3), or 36.
The payments are made at the end of the payment periods.
The annual interest rate is 16.5%.
The compounding frequency is 12 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the payment amount is $76.190...
The monthly payments are $76.20. Therefore, the total cost of the rifle is (76.190...)(36), which is equal to $2742.848..., or $2742.85.
b) The present value is $2152.
The regular payment amount is unknown.
The payment frequency is 52 times a year.
The number of payments is (52 · 2), or 104.
The payments are made at the end of the payment periods.
The annual interest rate is 8.5%.
The compounding frequency is 52 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the payment amount is $22.517...
The weekly payments are $22.52. Therefore, the total cost of the rifle is (22.517... · 104), which is equal to $2341.854..., or $2341.85.
c) Difference = 2742.85 – 2341.85
Difference = 401.00
The difference in the amount of interest is $401.00.
d) e.g., Mike would make smaller payments to the store each month, and has one additional year to pay off his loan.

16. a) Bank loan: The present value is $3000.
The regular payment amount is $125.
The payment frequency is 12 times a year.
The number of payments is unknown.
The payments are made at the end of the payment periods.
The annual interest rate is 4.7%.
The compounding frequency is 12 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the term of this loan is 25.253... or 26 months.

Investor loan:
The present value is $3000.
The regular payment amount is $250.
The payment frequency is 12 times a year.
The number of payments is unknown.
The payments are made at the end of the payment periods.
The annual interest rate is 5%.
The compounding frequency is 12 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the term of this loan is 12.336... or 13 months.

b) Bank Loan:
$I = A - P$
$I = (25.253... \cdot 125) - 3000$
$I = 3156.675... - 3000$
$I = \$156.675...$
Investor Loan:
$I = A - P$
$I = (12.336... \cdot 250) - 3000$
$I = 3084.004... - 3000$
$I = \$84.004...$
Elise will need to pay \$156.68 in interest for the bank loan or \$84.01 for the investor loan.
c) Elise would pay a total of \$3156.68 including principal and interest for the bank loan or \$3084.01 including principal and interest for the investor loan.
d) e.g., Elise should take the loan from the investors if she can make the \$250 monthly payments because she pays less interest. Also, she will carry the debt for less time.

17. a) Option A:
The present value is \$21 000.
The regular payment amount is unknown.
The payment frequency is 12 times a year.
The number of payments is (12 · 4), or 48.
The payments are made at the end of the payment periods.
The annual interest rate is 1.8%.
The compounding frequency is 12 times a year.
The future value is \$0.
Using the financial application on a graphing calculator, the regular monthly payment is \$453.766..., or \$453.77.

Option B: The present value is \$16 000.
The regular payment amount is unknown.
The payment frequency is 12 times a year.
The number of payments is (12 · 3), or 36.
The payments are made at the end of the payment periods.
The annual interest rate is 1.8%.
The compounding frequency is 12 times a year.
The future value is \$0.
Using the financial application on a graphing calculator, the regular monthly payment is \$456.885..., or \$456.89.
b) Option A:
$I = A - P$
$I = (48 \cdot 453.766...) - 21\,000$
$I = 21\,780.810... - 21\,000$
$I = \$780.810...$
Option B:
$I = A - P$
$I = (36 \cdot 456.885...) - 16\,000$
$I = 16\,447.881... - 16\,000$
$I = \$447.881...$
The total amount of interest for option A is \$780.81, and the total amount of interest for option B is \$447.88.
c) e.g., Connor should take option B, if he can afford the \$5000 down payment, because he pays less interest and the term is shorter.

18. The principal is \$5000. The interest per payment period is equal to 112.5 divided by 5000, which is 2.25%. The number of payments is 8 and the regular payment is \$689.93. The total interest paid is \$519.38. The total amount paid is \$5519.38. You can also determine the amount of the interest or principal paid for any individual payment and the balance at the end of each payment period.

19. Option A:
The present value is \$120 000.
The regular payment amount is unknown.
The payment frequency is 1 time a year.
The number of payments is 20.
The payments are made at the end of the payment periods.
The annual interest rate is 4%.
The compounding frequency is 1 time a year.
The future value is \$0.
Using the financial application on a graphing calculator, the annual payment is \$8829.810..., or \$8829.81 and the total interest paid is \$56 596.200... or \$56 596.20.

Option B:
The present value is \$120 000.
The regular payment amount is unknown.
The payment frequency is 12 times a year.
The number of payments is (12 · 20), or 240.
The payments are made at the end of the payment periods.
The annual interest rate is 4%.
The compounding frequency is 12 times a year.
The future value is \$0.
Using the financial application on a graphing calculator, the monthly payment is \$727.176..., or \$727.18, so the annual payment amount is \$8726.12. The total interest paid is \$54 522.334... or \$54 522.33.

Option C:
The present value is \$120 000.
The regular payment amount is unknown.
The payment frequency is 1 time a year.
The number of payments is 10.
The payments are made at the end of the payment periods.
The annual interest rate is 8%.
The compounding frequency is 1 time a year.
The future value is \$0.
Using the financial application on a graphing calculator, the annual payment is \$17 883.538..., or \$17 883.54, and the total interest paid is \$58 835.386... or \$58 835.39.

Option D:
The present value is $120 000.
The regular payment amount is unknown.
The payment frequency is 12 times a year.
The number of payments is (12 · 10), or 120.
The payments are made at the end of the payment periods.
The annual interest rate is 8%.
The compounding frequency is 12 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the monthly payment is $1455.931…, or $1455.93, so the total payment amount for the year is $17 471.17. The total interest paid is $54 711.735… or $54 711.74.
e.g., Choose Option B, as it has a manageable monthly payment, it has the longest term, and it incurs the least amount of interest over the life of the loan.

20. Option A:

$$A = P(1+i)^n$$

$$A = 25000\left(1+\frac{0.035}{12}\right)^{60}$$

$$A = 25000(1.002...)^{60}$$

$$A = 29773.570...$$

The total cost of option A is $29 773.58.
Option B:
The present value is $25 000.
The regular payment amount is unknown.
The payment frequency is 12 times per year.
The number of payments is 60.
The payments are made at the end of the payment periods.
The annual interest rate is 7%.
The compounding frequency is 12 times per year.
The future value is $0.
Using the financial application on a graphing calculator, the monthly payments will be $495.029… or $495.03.
The interest cost is $4701.80.
e.g., Option B is the better option because Gabe would pay $71.77 less interest.

21. a) The present value is $50 000.
The regular payment amount is $1000.
The payment frequency is 12 times a year.
The number of payments is 24.
The payments are made at the end of the payment periods.
The annual interest rate is 3.5%.
The compounding frequency is 12 times a year.
The future value is unknown.
Using the financial application on a graphing calculator, the future value is $28 797.460…
The outstanding balance at the end of 2 years is $28 797.46.
b) The present value is $50 000.
The regular payment amount is $1000.
The payment frequency is 12 times a year.
The number of payments is unknown.
The payments are made at the end of the payment periods.
The annual interest rate is 3.5%.
The compounding frequency is 12 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the number of payments is 54.122…, or 55.
It will take Sal 55 months or 4 years 7 months to pay off this loan.
c) The present value is $28 797.46.
The regular payment amount is $1200.
The payment frequency is 12 times a year.
The number of payments is unknown.
The payments are made at the end of the payment periods.
The annual interest rate is 3.5%.
The compounding frequency is 12 times a year.
The future value is $0.
The number of additional payments is 24.915…, or 25.

Total number of payments = 2(12) + 25
Total number of payments = 49
Sal will repay the loan 6 months sooner, if he increases his monthly payment to $1200.

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D. Investment - Single Payment:
Principal Invested: $12000 (6)
Interest Rate: 6% (6)
Compounding Frequency: Daily (6)
Term: 6 years (6)
Interest Earned: $5199.44

Loan – Single Payment:
Principal Borrowed: $2000 (1)
Interest Rate: 1% (1)
Compounding Frequency: Annual (1)
Term: 1 year (1)
Interest Earned: $20

To earn the most possible interest on the investment, 4 sixes must be rolled. To pay the least possible interest on a loan, 4 ones must be rolled.

E. i) Investment - Regular Payments:

Most:
Regular Payment Amount: $300 (6)
Payment Frequency: Weekly (5)
Interest Rate: 6% (6)
Compounding Frequency: Daily (6)
Term: 6 years (6)
Interest Earned: $18 998.90

Least:
Regular Payment Amount: $50 (1)
Payment Frequency: Annual (1)
Interest Rate: 1% (1)
Compounding Frequency: Annual (1)
Term: 1 year (1)
Interest Earned: $0.50

To earn the least amount of interest, 5 ones must be rolled. To earn the most amount of interest, 4 sixes and 1 five must be rolled.

ii) Loan - Regular Payments:
Most:
Principal Borrowed: $12 000 (6)
Payment Frequency: Annual (1)
Interest Rate: 6% (6)
Compounding Frequency: Daily (6)
Term: 6 years (6)
Interest Charged: $2726.46
Least:
Principal Borrowed: $2000 (1)
Payment Frequency: Weekly (5)
Interest Rate: 1% (1)
Compounding Frequency: Annual (1)
Term: 1 year (1)
Interest Charged: $10.16
The player would pay the least amount of interest if the player rolls 4 ones and 1 five. The player would pay the most amount of interest if the player rolls 4 sixes and 1 one.
F. When an investment is made, the player wants to try and earn the highest amount of interest possible. When a loan is taken, the player wants to pay the lowest amount of interest possible.

Lesson 2.2: Exploring Credit Card Use, page 100

1. a) Dealership credit card:
The present value is (5000 – 5000(0.024)), or $4880.
The regular payment amount is $200.
The payment frequency is 12 times a year.
The number of payments is unknown.
The payments are made at the end of the payment periods.
The annual interest rate is 15.8%.
The compounding frequency is 365 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the number of payments is 29.669… or 30.

In total, Mia will end up paying $5933.804… or $5933.81.

Bank loan:
The present value is $5000.
The regular payment amount is $200.
The payment frequency is 12 times a year.
The number of payments is unknown.
The payments are made at the end of the payment periods.
The annual interest rate is 9.8%.
The compounding frequency is 12 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the number of payments is 28.077… or 29.

In total, Mia will end up paying $5615.429…, or $5615.43.

b) Dealership credit card:
$I = A - P$
$I = 5933.804\ldots - 4880$
$I = \$1053.804\ldots$
Mia will pay $1053.81 in interest using the dealership credit card.

Bank loan:
$I = A - P$
$I = 5615.429\ldots - 5000$
$I = \$615.429\ldots$
Mia will pay $615.43 in interest on the bank loan.
c) Dealership credit card:

$$\text{Term} = 30 \cdot \frac{365}{12}$$

$$\text{Term} = 912.5$$

It will take Mia 912.5 days, or 2 years 6 months, to pay off the credit card

Bank loan:
Term = 29 months
It will take Mia 29 months, or 2 years 5 months, to pay off the bank loan
d) e.g., She should use the bank loan, because she will pay it off sooner and pay less overall.

2. Card Blue: Cash back = 2150.66 · 0.03 = $64.52
The present value is $2150.66.
The regular payment amount is $200.
The payment frequency is 12 times a year.
The number of payments is unknown.
The payments are made at the end of the payment periods.
The annual interest rate is 18.5%.
The compounding frequency is 365 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the number of payments is 11.856…, or 12. The total amount of interest paid is $220.724…, or $220.73. Therefore, the total additional cost of using card Blue is $220.73 – $64.52, or $156.21.

Card Red: The present value is $2150.66.
The regular payment amount is $200.
The payment frequency is 12 times a year.
The number of payments is unknown.
The payments are made at the end of the payment periods.
The annual interest rate is 16.25%.
The compounding frequency is 365 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the number of payments is 11.707…, or 12. The total amount of interest paid is $190.751…, or $190.76.
Hannah should use card Blue, because the payments are for the same amount and are at the same time for both cards, but she will pay $34.55 less using Card Blue.