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

Bank loan:
$I = A - P$
$I = 5615.429... - 5000$
$I = \$615.429...$
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.

3. Assume that payments begin on July 1st, and that neither card carries a balance at this point.
Annie's credit card:
Months 1–6:
The present value is 3678 + 785, or $4463.
The regular payment amount is $400.
The payment frequency is 12 times a year.
The number of payments is 6.
The payments are made at the end of the payment periods.
The annual interest rate is 15.5%.
The compounding frequency is 365 times a year.
The future value is unknown.
Using the financial application on a graphing calculator, the future value is $2343.208....
After 6 months, the balance on the credit card is $2343.208..., or $2343.21.
Annie has paid $2400.

Month 7 onward:
The present value is 2343.21 + 75, or $2418.21.
The regular payment amount is $400.
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 15.5%.
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 6.337..., or 7.
Annie has paid 6.337... · $400, or $2534.85.

The total number of payments needed is 13, and the total amount paid is $2400 + $2534.85, or $4934.85.

Peter's credit card:
The present value is 3678 + 785, or $4463.
The regular payment amount is $400.
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 18.7%.
The compounding frequency is 365 times a year.
The future value is $0.
Using the financial application on a graphing calculator, the total number of payments is 12.362..., or 13. The total amount paid is
12.362... · $400, or $4944.992..., or $4945.00.

They should use Annie's credit card, because it costs less overall.

4. a) Card A:
The present value is 1186 + 25, or $1211.
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 8.9%.
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 10.092..., or 11. The total amount paid is 10.092... · $125, or $1261.554..., or $1261.56.

Card B:
The present value is 1186 + 50, or $1236.
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 14.9%.
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 10.619..., or 11. The total amount paid is 10.619... · $125, or $1327.487..., or $1327.49.

Shannon would pay $1261.60 with card A, and $1327.49 with card B.

b) i) Card B with immediate rebate of $75:
The present value is 1186 – 75 + 50, or $1161.
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 14.9%.
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 9.934..., or 10. The total amount paid is 9.934... · $125, or $1241.751..., or $1241.76.
This incentive would make card B more attractive, because it now costs less to use card B than card A.
ii) 1% of $1186 = $11.86
Total cost of card B = 1327.49 – 11.86
Total cost of card B = $1315.63
Card A is still the better choice, because it costs less than $1315.63.
iii) Card B with no annual fee:
The present value is $1186.
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 14.9%.
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 10.1619..., or 11. The total amount paid is 10.1619... · $125, or $1270.248..., or $1270.25.
Card A is still the better choice, because it costs about 8 dollars less than card B with no annual fee.