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:

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

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... \cdot 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 Α. ii) 1% of \$1186 = \$11.86 Total cost of card B = 1327.49 – 11.86 Total cost of card B = \$1315.63Card 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.