

## Practice Quiz 2: Time Value of Money

1. What is more valuable: \$1,000 today or \$1,000 in one year? Why?
2. Using an interest rate of 7%, calculate the present value of \$300 to be received in (a) one year, (b) five years, and (c) ten years.
3. John plans to purchase a one-year Treasury Bill (T-Bill). The T-Bill will pay the holder \$1,000 in one year. If John requires a return of at least 2% on such an investment, what is the most he will be willing to pay for the T-Bill?
4. Mike is considering quitting his job to start a bakery, his dream work. To do so, he would need to make an investment of \$80,000 today. He estimates that the bakery would generate revenues of \$90,000 over the next five years and would require \$20,000 in expenses. At his current job he earns \$50,000. Therefore, Mike estimates that the incremental cash flows from opening the bakery would be \$20,000 per year for the next five years. Calculate the NPV of the business using a discount rate of 15%. Should Mike quit his job and start the bakery?
5. Calculate the IRR for the project described in problem 4. If Mike requires a return of 15% on the business, should he start the bakery?
6. If Mike instead invests an additional \$5,000 in new equipment and upgrades for the bakery each year, the bakery will remain operational and generate net cash flows of \$15,000 into perpetuity. Given the same initial investment of \$80,000 and discount rate of 15%, calculate the NPV of opening the bakery. Should Mike quit his job and start the bakery?
7. Bobby buys a scratch-off ticket every day and today he hits it big with a \$100,000 winning ticket. But when he turns in his ticket, he's informed of the fine print that states the \$100,000 is payable in annual installments of \$10,000 per year over the next 10 years. If he wants a lump sum today, he will only get \$85,000. If the interest rate is 5%, is it better for Bobby to take the ten \$10,000 annual installments or the \$85,000 lump sum?
8. Jordan is considering starting a Widget manufacturing company. The initial investment in tools will cost \$1,500,000. Jordan estimates that he can earn profits of \$50,000 a year for the first 2 years while he establishes the business, \$100,000 a year for the next 3 years, and then \$200,000 a year for 10 more years before the tools wear out. The project is risky, because Jordan is not certain he will earn these profits. To compensate for this risk, Jordan requires a high return of 25% on such an investment. What is the net present value (NPV) of this business project? Should Jordan undertake the investment?
9. Alice is a young professional and is considering a certification program for her field. The certification program is a self-study program that will take three years. The cost is

\$1,000 per year. Further, Alice estimates that it will take 200 hours of study time per year, and since she values her time at her wage of \$30 per hour, she considers the \$6,000 of lost time per year a cost of the program. On average, professionals with the certification make \$5,000 more per year. Assuming a cost of \$7,000 per year for the next three years and an increase in income of \$5,000 for the following 30 years, what is the return on this certification? If Alice requires a return of 10%, should she pursue the certification?