Annuities

1. Find the amount of an annuity that consists of 20 semiannual payments of $500 each into an account that pays 6% interest per year, compounded semiannually.
2. Find the amount of an annuity that consists of 16 quarterly payments of $300 each into an account that pays 8% interest per year, compounded quarterly.
3. Find the amount of an annuity that consists of 40 annual payments of $2000 each into an account that pays interest of 5% per year.
4. How much money should be invested every quarter at 10% per year, compounded quarterly, to have $5000 in 2 years?
5. How much money should be invested monthly at 6% per year, compounded monthly, to have $2000 in 8 months?
6. What is the present value of an annuity that consists of 20 semiannual payments of $1000 at an interest rate of 9% per year, compounded semiannually?
7. What is the present value of an annuity that consists of 30 monthly payments of $300 at an interest rate of 8% per year, compounded monthly.
8. How much money must be invested now at 9% per year, compounded semiannually, to fund an annuity of 20 payments of $200 each, paid every 6 months, the first payment being 6 months from now?
9. A 55-year-old man deposits $50,000 to fund an annuity with an insurance company. The money will be invested at 8% per year, compounded semiannually. He is to draw semiannual payments until he reaches age 65. What is the amount of each payment?
10. A woman wants to borrow $12,000 to buy a car. She wants to repay the loan by monthly installments for 4 years. If the interest rate on this loan is % per year, compounded monthly, what is the amount of each payment?
11. What is the monthly payment on a 30-year mortgage of $80,000 at 9% interest? What is the monthly payment on this same mortgage if it is to be repaid over a 15-year period?
12. What is the monthly payment on a 30-year mortgage of $100,000 at 8% interest per year, compounded monthly? What is the total amount paid on this loan over the 30-year period?
13. What is the monthly payment on a 15-year mortgage of $200,000 at 6% interest? What is the total amount paid on this loan over the 15-year period?
14. Dr. Gupta is considering a 30-year mortgage at 6% interest. She can make payments of $3500 a month. What size loan can she afford?
15. Jane agrees to buy a car for a down payment of $2000 and payments of $220 per month for 3 years. If the interest rate is 8% per year, compounded monthly, what is the actual purchase price of her car?
16. Mike buys a ring for his fiancee by paying $30 a month for one year. If the interest rate is 10% per year, compounded monthly, what is the price of the ring?
17. A couple secures a 30-year loan of $100,000 at $9\frac{3}{4}$ % per year, compounded monthly, to buy a house.
    (a) What is the amount of their monthly payment?
    (b) Whattotalamountwilltheypayoverthe30-yearperiod?
    (c) If, instead of taking the loan, the couple deposits the monthly payments in an account that pays % interest per year, compounded monthly, how much will be in the account at the end of the 30-year period?
18. A couple needs a mortgage of $300,000. Their mortgage broker presents them with two options: a 30-year mortgage at interest or a 15-year mortgage at interest.
    (a) Find the monthly payment on the 30-year mortgage and on the 15-year mortgage. Which mortgage has the larger monthly payment?
    (b) Find the total amount to be paid over the life of each loan. Which mortgage has the lower total payment over its lifetime?
19. John buys a stereo system for $640. He agrees to pay $32 a month for 2 years. Assuming that interest is compounded monthly, what interest rate is he paying?
20. Janet's payments on her $12,500 car are $420 a month for 3 years. Assuming that interest is compounded monthly, what interest rate is she paying on the car loan?
21. An item at a department store is priced at $189.99 and can be bought by making 20 payments of $10.50. Find the interest rate, assuming that interest is compounded monthly.
22. A man purchases a $2000 diamond ring for a down payment of $200 and monthly installments of $88 for 2 years. Assuming that interest is compounded monthly, what interest rate is he paying?

Answers:

1. $13,435.19
2. $5591.79
3. $241,599.55
4. $572.34
5. $245.66
6. $13,007.94
7. $8132.65
8. $2601.59
9. $3679.09
10. $307.24
11. $811.41
12. $264,153.60
13. $303,787.80
14. $583,770.65
15. $9020.60
16. $341.24
17. a. $859.15
    b. $309,294
    c. $1,841,519.29
18. a. The 15 year mortgage has a larger monthly payment: $2491.23 vs. 1896.20
    b. The 15 year mortgage has a lower total payment: $448,421.40 vs. 682,632.00
19. 18.16%
20. 12.80%
21. 11.68%
22. 15.84%