1. What principal will grow to $8,000 in four years and five months at 12% compounded quarterly?

2. What is the maturity value of an eight-month promissory note for $7,000 with an interest rate of 14% compounded semiannually?

3. Debts of $3,000 due one year ago and $7,000 due in eight months are to be paid with one single payment six months from now. What is the size of the payment if money is worth 9% compounded monthly?

4. At what nominal rate of interest will money triple in fifteen years if compounded monthly?

5. In how many years and months (to the nearest month) will money double itself at 14% compounded semiannually?

6. What nominal rate compounded monthly is equivalent to 8% compounded quarterly?

7. An invoice indicates that interest at the rate of 1.5% per month will be charged on overdue amounts. What effective rate of interest is being charged?

8. Find the nominal rate of interest compounded semiannually which is equivalent to an effective rate of 17%.

9. What is the effective rate of interest if $2,000 grows to $3,500 in five years compounded quarterly?

10. Barry wants to have $30,000 twelve years from now. He plans to make equal payments at the end of every three months for the next eight years. What size deposits must he make if his deposits earn 7% compounded quarterly during the twelve year period?

11. Jeff plans to retire 30 years from now. He sets up a special savings plan whereby he will deposit $120 at the end of each month for the 20 years. The savings account pays interest at 9% compounded monthly. How much money will be in Jeff’s account at the date of his retirement?

12. What is the economic value today of receiving $1,200 at the end of each month for the next seven years if money can earn 7% compounded monthly during that time period?

13. What is the economic value today of receiving 36 monthly payments of $1,000 with the first payment received nine months from today? Assume money can earn 11.5% compounded monthly.

Academic Success Centre www.rrc.mb.ca/asc
These questions were compiled by Michael Reimer for the Academic Success Centre.
14. A television was purchased on credit with 24 monthly payments of $50. The first payment was made one month after the date of purchase and the interest rate charged was 18% compounded monthly. What was the purchase price of the television?

15. Fred purchased a car with a $2,500 down payment and end of month payments of $450 for four and a half years. The interest rate charged was 6.5% compounded monthly. What was the purchase price of the car?

16. Barney owes $20,000 one year from now. What end of month payment made for the next twelve months would completely pay off this debt if the creditor agrees to an interest rate of 11% compounded monthly?

17. Betty bought a car priced at $12,000. She made a down payment of $2,000 and agreed to pay the balance in 60 equal monthly payments. If she was charged 9% compounded monthly, what should be the amount of each payment?

18. Jon is saving his money so that he can buy a car in three years’ time worth $9,000. If his first monthly deposit is one month from now and he earns 8% compounded monthly, what would be the size of his monthly deposits?

19. Phil bought a boat priced at $22,000 for 20% down and the balance in equal end of month payments over five years at 22% compounded monthly. What does Phil have to pay each month?

20. You have taken out a $10,000 loan and you are repaying it with semiannual payments of $1,200 each. Interest on the loan is 9% compounded semiannually. How long will it take to pay off the loan if the first payment is made six months after the date of the loan?

21. How long will it take to save at $20,000 by making deposits of $300 at the end of every quarter into a special savings account earning 7% compounded monthly?

22. A large screen television priced at $1,057.53 was paid for by 12 monthly payments of $100 with the first payment made one month after the date of purchase. What annual interest rate compounded monthly was charged?

23. A life insurance company will sell a 20–year annuity paying $2,000 at the end of each month for $200,000. What rate of interest compounded quarterly will the annuitant earn?

24. Deposits of $5,000 are made at the beginning of every three months for five years to a fund which pays 10% compounded monthly. How much will be in the fund after five years?

25. A life insurance company will sell a 20 year annuity paying $1,600 at the end of each month for $175,000. What annual rate of interest compounded quarterly will the annuitant earn?

26. Semiannual deposits of $500 are made to a fund which pays interest of 8.5% compounded quarterly. How much is in the fund immediately after the twentieth deposit?

27. If you make twenty–four monthly deposits of $1,750 into a fund which pays 7.75% compounded quarterly. How much money will be in the fund two years after the last deposit?
28. Today, Meg has $35,000 in a special savings account which pays 9.5% compounded monthly. If she decides to withdraw $1,600 every three months beginning three months from today, for how long can Meg made withdrawals? Include the final partial payment.

29. What single payment now is equivalent to making 36 quarterly payments of $1,250? The first quarterly payment is three months from now and interest is 5.5% compounded monthly.

30. What is the cash value of a lease requiring payments of $850 at the beginning of each month for six years if interest is 12% compounded semiannually?

31. How large a fund is required now for the awarding of annual scholarships in perpetuity of $1,500 beginning one year from now if the fund can earn 8% compounded annually?

32. What dollar amount for a scholarship can be awarded annually in perpetuity beginning today from a $100,000 fund that can be invested at 7.25% compounded annually?

33. What is the rate of interest compounded annually on a lease valued at $8,000 now or twelve monthly payments of $700 beginning now?

34. Dan deposits $10,000 into a special savings account which pays 7% compounded monthly. How many monthly withdrawals of $310 can he make if his first withdrawal is exactly five years from today? Include the final smaller withdrawal.

35. A $50,000 loan is amortized by monthly payments over 15 years. The interest rate charged is 13% compounded quarterly. How much interest will have been paid at the end of three years?

36. A $195,000 mortgage is amortized by monthly payments over 25 years. Interest is 8.5% compounded semiannually. How much principal will you pay during year 13?

37. A $6,000 loan is to be amortized by equal payments at the end of each month for 3 years. The interest rate is 10% compounded monthly. How much interest is paid during the 22nd payment?

38. A $60,000 loan at 12% compounded semiannually is to be repaid by monthly payments of $1,000 beginning one month after the date of the loan. What is the size of the final payment?

39. Two investment alternatives will require the same cash outlay to purchase. Alternative A will pay you $15,000 each year for five years. Alternative B will pay you $7,500 each year for eleven years. If money is worth 10% compounded annually, which investment is better and by how much?

40. The following three choices are available in order to settle an obligation:
   #1 – Pay $20,000 now,
   #2 – Pay 40 quarterly payments of $1,000 beginning now, or,
   #3 – Pay $5,000 today and $16,000 one year from now.
   If money is worth 15% compounded quarterly, from the point of view of the individual paying the money, which alternative is best?
41. A contract is estimated to yield 48 quarterly net returns of $3,000 beginning three months from now. To secure the contract an outlay of $40,000 now and $35,000 two years from now is required. If this investment can earn 12% compounded quarterly, what is the net present value for the contractor?

42. The development of a new product requires an immediate investment of $100,000 and $40,000 at the end of each of the next four years. Net annual returns of $25,000 commencing four years from now are expected. The company also expects ten years of these annual returns. If the company requires a rate of return of 10% compounded annually, what would be the net present value and should the development of this product be undertaken?

43. What would be a fair price for a machine that saves $2,000 per year in labour costs and has a scrap value of $4,000 at the end of ten years if money is worth 9% compounded annually?

44. A machine can be leased for five years at $3,000 per month payable in advance. Alternatively, it can be purchased for $150,000 and sold for $20,000 in five years. Should the machine be purchased or leased if the firm's cost of borrowing is 10% compounded annually? How much would you save by choosing the cheaper option?