Chapter 4: Math of Finance Problems

Identify the type of problem.

1. Anna wants to have $5,000 saved when she graduates from college so that she will have a down payment for a new car. Her credit union pays 5% annual interest compounded monthly. How much money should she deposit each month to have the money available when she graduates in 3 years?

   A. Amortization Fund
   B. Sinking Fund
   C. Future Value of an Annuity
   D. Present Value of an Annuity
   E. Present Value with Compound Interest

2. Bill bought a new car. His financing deal was a 5 year loan at 9.98% annual interest compounded monthly. His monthly payment was $421.25 and he paid no money down. What was the total purchase price of the car?

   A. Amortization Fund
   B. Sinking Fund
   C. Future Value of an Annuity
   D. Present Value of an Annuity
   E. Present Value with Compound Interest

3. Sergio wants to have $5,000 in the bank in 3 years to pay for an Alaskan cruise. How much cash should he deposit today, if the bank pays 4% annual interest compounded quarterly, if he wants to be sure to have the funds available in 3 years?

   A. Amortization Fund
   B. Sinking Fund
   C. Future Value of an Annuity
   D. Present Value of an Annuity
   E. Present Value with Compound Interest

4. Edwin and Frances are buying a new home. The purchase price is $155,000. They will make a 10% down payment on the house. Their loan for the house is a 30 year conventional loan at 6.75% per year compounded monthly. Find their monthly payment.

   A. Amortization Fund
   B. Sinking Fund
   C. Future Value of an Annuity
   D. Present Value of an Annuity
   E. Present Value with Compound Interest

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5. Grace decides to start a savings program when she gets her first job after graduation. She deposits $2,500 into her credit union savings account. The credit union pays 3.8% annual interest compounded quarterly. How much money will she have in the account after 4 years?

   A. Amortization Fund
   B. Sinking Fund
   C. Future Value of an Annuity
   D. Present Value of an Annuity
   E. Present Value with Compound Interest

F.V. with C.I.

6. Helen bought a new computer. The finance company charged her 15% per year compounded monthly. Her monthly payments were $88.23 for 2 years and she made no down payment. What was the original price of the computer?

   A. Amortization Fund
   B. Sinking Fund
   C. Future Value of an Annuity
   D. Present Value of an Annuity
   E. Present Value with Compound Interest

7. Gary decided to save some money for his daughter's college education. He decided to save $300 per quarter. His credit union pays 4.5% per year compounded quarterly. How much money will he have available when his daughter starts college in 10 years?

   A. Amortization Fund
   B. Sinking Fund
   C. Future Value of an Annuity
   D. Present Value of an Annuity
   E. Present Value with Compound Interest

8. Jolene owns a clothing store. She anticipates that she will need to replace her telephone system in 3 years. She projects that a new system will cost $12,500. Her bank pays 5% annual interest compounded semiannually. How much should she deposit semiannually in order to be able to pay cash for the new phone system?

   A. Amortization Fund
   B. Sinking Fund
   C. Future Value of an Annuity
   D. Present Value of an Annuity
   E. Present Value with Compound Interest

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9. Kris wins the lottery and decides to deposit $25,000 of his winnings in an account for his nephew. The bank pays 6.2% annual interest compounded monthly. How much will he be able to give his nephew in 5 years?

   A. Amortization Fund
   B. Sinking Fund
   C. Future Value of an Annuity
   D. Present Value of an Annuity
   E. Present Value with Compound Interest

F.V. with C.I.

10. Megan bought a new car. Her car payments are $385.17 for 6 years. Her financing rate was 8.9% annual interest compounded monthly. She made a $1,200 down payment. What was the total purchase price of the car?

    A. Amortization Fund
    B. Sinking Fund
    C. Future Value of an Annuity
    D. Present Value of an Annuity
    E. Present Value with Compound Interest

11. A company has an immediate need for a loan. In an agreement worked out with its banker, the company assigns its royalty income of $4,800 per month for the next 3 years from certain oil properties to the bank, with the first payment due at the end of the first month. If the bank charges interest at the rate of 9% per year compounded monthly, what is the amount of the loan negotiated between the parties?

    A. Amortization Fund
    B. Sinking Fund
    C. Future Value of an Annuity
    D. Present Value of an Annuity
    E. Present Value with Compound Interest

12. Carol's employer deposits $1,000 per quarter into a retirement plan that earns 3.5% annual interest compounded quarterly. How much will be in the plan when she retires in 32 years?

    A. Amortization Fund
    B. Sinking Fund
    C. Future Value of an Annuity
    D. Present Value of an Annuity
    E. Present Value with Compound Interest

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13. Kelly wishes to buy a car that costs $32,998. The car dealer tells her that they can finance the car at 6.25% per year compounded monthly for 5 years. She decides to secure the loan from the dealer. How much will her monthly payments be?

    A. Amortization Fund
    B. Sinking Fund
    C. Future Value of an Annuity
    D. Present Value of an Annuity
    E. Present Value with Compound Interest

14. David owns a small business and knows that he will need to purchase two new delivery vans in 5 years. He anticipates that the vans will cost the business $28,500 each. His bank pays 4.2% per year compounded monthly. How much should he deposit each month so that he will have the funds available to buy the vans in 5 years?

    A. Amortization Fund
    B. Sinking Fund
    C. Future Value of an Annuity
    D. Present Value of an Annuity
    E. Present Value with Compound Interest

15. Mary deposited $5,000 in an account that earns 9% per year compounded monthly. How much will she have in 40 years, when she retires?

    A. Amortization Fund
    B. Sinking Fund
    C. Future Value of an Annuity
    D. Present Value of an Annuity
    E. Present Value with Compound Interest

    F.V. with C.I.

16. Denise wishes to have $6,000 in an account in 3 years. Her bank will pay 3.25% per year compounded semiannually. How much should she deposit now to have the desired amount of money in the account in 3 years?

    A. Amortization Fund
    B. Sinking Fund
    C. Future Value of an Annuity
    D. Present Value of an Annuity
    E. Present Value with Compound Interest

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17. Parents agree to invest $500 at 10% per year compounded semiannually for their son on the December 31 or June 30 following each semester that he makes the Dean's list during his 4 years in college. If he makes the Dean's list in each of the 8 semesters, how much money will his parents have to give him when he graduates in 4 years?

    A. Amortization Fund
    B. Sinking Fund
    C. Future Value of an Annuity
    D. Present Value of an Annuity
    E. Present Value with Compound Interest

18. A health club offers to let you join for $50 down and payments of only $36 per month for 3 years. When you read the fine print, you discover that the interest rate is 18% per year compounded monthly. What is the cash price of the health club membership? How much will the club membership cost you after 3 years?

    36 x 36 + 50

    A. Amortization Fund
    B. Sinking Fund
    C. Future Value of an Annuity
    D. Present Value of an Annuity
    E. Present Value with Compound Interest

19. Nicholas and Olivia are buying a house for $250,000. They made a 15% down payment. Their financing is for 30 years at 6.78% annual interest compounded monthly. Find their monthly payment.

    A. Amortization Fund
    B. Sinking Fund
    C. Future Value of an Annuity
    D. Present Value of an Annuity
    E. Present Value with Compound Interest

20. A lending company recently offered 36-month auto loans at 7.56% per year compounded monthly to applicants with good credit ratings. If you have a good credit rating and can afford monthly payments of $350, how much can you borrow from the company?

    A. Amortization Fund
    B. Sinking Fund
    C. Future Value of an Annuity
    D. Present Value of an Annuity
    E. Present Value with Compound Interest

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Solutions

1. Sinking Fund; $129.02
2. Present Value of an Annuity; $19,835.47
3. Present Value with compound interest; $4,437.25
4. Amortization; $904.79
5. Future Value with compound interest; $2,908.31
6. Present Value of an Annuity; $2,084.79
7. Future Value of an Annuity; $15,050.05
8. Sinking Fund; $1,956.87
9. Future Value with compound interest; $34,058.44
10. Present Value of an Annuity; $22,626.97
11. Present Value of an Annuity; $150,944.67
12. Future Value of an Annuity; $234,281.12
13. Amortization; $641.79
14. Sinking Fund; $855.39
15. Future Value with compound interest; $180,549.51
16. Present Value with compound interest; $5,446.88
17. Future Value of an Annuity; $3,231.61
18. Present Value of an Annuity; $1,045.78; $1,346.00
19. Amortization; $1,382.51
20. Present Value of an Annuity; $11,241.81