



Chapter 5 Review

5.1

Find the formula for the n th term and the first three terms of the (a) arithmetic sequence and (b) geometric sequence with the given a_1 and d values.

1. $a_1 = -4, d = 3$
2. $a_1 = \frac{1}{2}, d = \frac{5}{2}$
3. $a_1 = 25, d = -2$
4. $a_1 = 1, d = 6$

Given the first term, a_1 , of an (a) arithmetic and (b) geometric sequence, and another term of the sequence, find the 12th term of that sequence.

5. a. $a_1 = 3, a_7 = 12$
b. $a_1 = 3, a_7 = 0.000003$
6. a. $a_1 = \frac{-1}{5}, a_4 = \frac{-19}{5}$
b. $a_1 = \frac{-1}{5}, a_4 = -25$
7. a. $a_1 = -6, a_{10} = 30$
b. $a_1 = -6, a_{10} = \frac{-3}{256}$

Find the sum of the first 80 terms of the arithmetic sequence given.

8. 1, 5, 9, 13, ...
9. 21, 15, 9, 3, ...

10. -10, -7, -4, -1, ...

Find the sum of the first 12 terms of the geometric sequence given.

11. 2, 8, 32, 128, ...
12. -4, -2, -1, $-\frac{1}{2}$, ...
13. 625, 375, 225, 135, ...

5.2

14. Hector has saved \$8,000 from his tips over the last year. If he invests it in an account paying 11% simple annual interest, how long will it take to be worth \$13,000? If, instead, he invests it in an account paying 11% interest compounded annually, how long will it take to be worth \$13,000?
15. If Betty only saved \$6,000 of her tips from last year, and she puts that money in an account paying 9% interest compounded monthly, how much will it be worth in 4 years?
16. What lump sum of money should be deposited in an account that will earn 7.2% interest compounded monthly to grow to \$250,000 for retirement in 30 years?
17. How much more interest will be earned if \$10,000 is invested for 8 years at 6% compounded continuously, instead of at 6% compounded quarterly?

2 Chapter 5 Review

18. If my money is invested at 8% compounded twice per year, what is the annual percentage yield (APY)? What is the APY if the money is compounded monthly instead?

5.3

19. Find the future value of an ordinary annuity of \$500 paid quarterly for 6 years, if the interest is 10% compounded quarterly.
20. Find the future value of an annuity due paying \$1200 each month for 4 years if the interest rate is 8.4% compounded monthly.
21. How much will need to be invested at the end of each year at 9% interest, compounded annually, to pay off a debt of \$30,000 in 10 years?
22. Lori's Baked Goods company establishes a sinking fund to discharge a debt of \$56,000 due in 8 years by making equal deposits twice yearly (semiannually), at the end of each period. If the investment pays 6.8% compounded semiannually, what is the amount of each deposit?
23. Margie retired from the post office and bought a small diner in town. She realizes that she needs an additional \$120,000 at the end of 15 years in order to truly retire from working altogether. She finds a safe investment account that pays 7.8% compounded monthly. What do her monthly investment payments, at the end of each month, need to be to reach her goal?
24. (Refer to problem 23.) If Margie can only afford to deposit \$280 per month, how many years will it take for her to reach her goal of saving \$120,000?

5.4

25. Jesse, in retirement, inherits \$93,000 upon his mother's death. He invests it at 6.6% compounded monthly in an ordinary annuity that pays out for the next 12 years. What amount does Jesse receive from this annuity every month?

26. A trust provides \$8,000 to a county library at the beginning of each 3-month period for the next 4 years. If money is worth 6.9% compounded quarterly, find the amount in the trust when it began.

27. As a result of a court settlement, an accident victim is awarded \$1.5 million. The attorney takes a third of this amount, another third is used for medical expenses already incurred, and the remaining third is invested in an account that earns 7.8% interest compounded monthly. What amount will the accident victim receive at the end of each month, if it pays for the next 10 years?

28. Find the present value of an annuity of \$3,200 paid at the end of each quarter for 5 years after being deferred for 3 years, if money is worth 8% compounded quarterly.

29. A couple received an inheritance of \$125,000 the year they turned 46 and invested it in a fund that earns 6.3% compounded monthly. If this amount is deferred for 16 years, until they retire, how much will it provide at the end of each month for the next 20 years after they retire?

5.5

30. Sean's parents loan him \$10,000 for a trip to Australia. He plans to amortize the loan and pay it back to them in 10 equal quarterly payments. If their interest rate is 6%, compounded quarterly, what is his periodic payment?
31. Frank purchases \$25,000 worth of equipment for his restaurant by making a \$4,000 down payment and amortizing the rest with monthly payments over the next 5 years. The interest rate on the debt is 8.4%, compounded monthly.
- What is his monthly payment amount?
 - Find the total amount paid over the life of the loan.
 - What is the total interest paid?



Chapter 5 Review 3

32. An investor interested in purchasing an apartment building determines that she can make payments of \$3000 per month. If a loan is available at 12%, compounded monthly, for 25 years, how much can she afford to pay for the building?
33. A young couple is ready to buy their first home. They have \$16,000 to use as a down payment, and their budget can support a monthly mortgage payment of \$1200. What is the most expensive home they can buy if they can borrow money for 30 years at a fixed 5.7% interest rate, compounded monthly?
34. My friend, Kathy, just bought a home, borrowing \$160,000 at a fixed 6.6% interest rate, compounded monthly, for 20 years. What monthly payment does she make? If she decides to sell the house after making exactly 24 monthly payments, what is the unpaid balance?





CHAPTER 5 REVIEW ANSWER KEY

1. a. $a_n = 3n - 7$; $-4, -3, 0$
b. $a_n = -4(3^{n-1})$; $-4, 12, 36$
2. a. $a_n = \frac{5}{2}n - 2$; $\frac{1}{2}, 3, \frac{11}{2}$
b. $a_n = \frac{1}{2}\left(\frac{5}{2}\right)^{n-1}$; $\frac{1}{2}, \frac{5}{4}, \frac{25}{8}$
3. a. $a_n = -2n + 27$; $25, 23, 21$
b. $a_n = 25(-2)^{n-1}$; $25, -50, 100$
4. a. $a_n = 6n - 5$; $1, 7, 13$
b. $a_n = 6^{n-1}$; $1, 6, 36$
5. a. 19.5
b. 3×10^{-11}
6. a. -13.4
b. $-9,765, 625$
7. a. 38
b. $\frac{-3}{1024}$
8. $12,720$
9. $-17,280$
10. $8,680$
11. $11,184,810$
12. $\frac{-4095}{512}$ or -7.998046875
13. 1559.098778
14. ~ 5.68 years; ~ 4.65 years
15. $\$8,588.43$
16. $\$29,017.96$
17. $\$2,861.57$
18. 8.16% ; 8.3%
19. $\$16,174.52$
20. $\$68,654.73$
21. $\$1,974.60$
22. $\$2,691.65$
23. $\$352.97$
24. ~ 17.12 years
25. $\$936.68$
26. $\$112,940.87$
27. $\$6,013.67$
28. $\$41,257.58$
29. $\$2,506.91$
30. $\$1,084.34$
31. a. $\$429.84$
b. $\$25,790.14$
c. $\$4,790.14$
32. $\$284,839.65$
33. $\$222,753.81$
34. $\$1,202.36$; $\$151,754.41$

