

HW31: Unit 4 Test Review

State whether the following sequences are arithmetic, geometric, or general.

1. 6, 24, 96, 384, ...

2. $\frac{5}{6} + \frac{6}{7} + \frac{7}{8} + \frac{8}{9} + \dots$

3. $\sum_{x=5}^{10} (x^2 - 1)$

4. $\frac{5}{2}, \frac{11}{6}, \frac{7}{6}, \frac{1}{2}, -\frac{1}{6}, \dots$

5. $-\frac{1}{4}, \frac{1}{8}, -\frac{1}{16}, \frac{1}{32}, \dots$

6. $\sum_{i=1}^{20} 5i$

State whether the following formulas are recursive or explicit. Write the first five terms for each sequence.

7. $a_n = -2n^2 + 1$

8. $a_1 = 2$ and $a_n = 2a_{n-1} - 6$

Write a general term formula for each sequence.

9. 30, 27, 24, 21, ...

10. $5, -1, \frac{1}{5}, -\frac{1}{25}, \dots$

Find the 20th term of the arithmetic sequence.

11. $a_6 = 42$ and $a_{12} = 96$

12. $a_7 = -23$ and $a_{30} = -115$

Find the first term of the geometric sequence.

13. $a_3 = 36$ and $a_7 = 2916$

14. $a_4 = \frac{2}{3}$ and $a_{10} = 46$

15. Find the sum of the first 20 terms of the arithmetic sequence $4 + 7 + 10 + 13 + \dots$

16. Find the sum of the first 10 terms of the geometric sequence $6 - 12 + 24 - 48 + \dots$

Find the indicated sum.

17. $\sum_{k=3}^8 3(2)^{k-1}$

18. $\sum_{n=2}^8 (3n+1)$

19. $\sum_{k=1}^4 (k^2 - 5)$

20. $\sum_{k=1}^{\infty} 2\left(-\frac{2}{3}\right)^k$

21. You want to buy a new TV for \$2100, but you have to save up over time. You save \$25 in the first month, \$35 the second month, \$45 the third month and so on. How much will you saved in the 12th month? How much will you have saved after 16 months? When will you have enough to buy the TV?

22. Edgar is getting better at math. On his first quiz he scored 57 points, then he scores 61 and 65 on his next two quizzes. If his scores continued to increase at the same rate, what will be his score on his 9th quiz? Show all work.

23. In a certain region, the number of highway accidents increased by 20% over a four year period. How many accidents were there in 2006 if there were 5120 in 2002?
24. If groceries now cost Mrs. Brooks \$240 per week, she predicts that the cost will increase 10% per year due to inflation and her three growing boys eating more and more each year. How much money will she be spending per week on groceries in 5 years?

Answers

- | | |
|--|------------------------------|
| 1. geometric | 14. $\frac{2}{81}$ |
| 2. general | 15. 650 |
| 3. general | 16. -2046 |
| 4. arithmetic | 17. 756 |
| 5. geometric | 18. 112 |
| 6. arithmetic | 19. 10 |
| 7. explicit, -1, -7, -17, -31, -49 | 20. $-\frac{4}{5}$ |
| 8. recursive, 2, -2, -10, -26, -58 | 21. \$135, \$1600, 19 months |
| 9. $a_n = -3n + 33$ | 22. 89 |
| 10. $a_n = 5\left(-\frac{1}{5}\right)^{n-1}$ | 23. about 10,617 accidents |
| 11. 168 | 24. \$386.52 |
| 12. -75 | |
| 13. 4 | |