**Show that the given sequence is geometric, and find the common ratio.**

1. 5, $-\frac{5}{4}$, $\frac{5}{16}$, …, 5($-\frac{1}{4})^{n-1},…$

**Find the fifth term, the eighth term, and the nth term of the geometric sequence.**

1. 8, 4, 2, 1, … 3. 300, -30, 3, -0.3, … 4. 5, 25, 125, 625, …

 5. 4, -6, 9, -13.5, … 6. 1, -x2, x4, -x6, … 7. 2, 2x+1, 22x+1, 23x+1, …

**Find all possible values of r for a geometric sequence with the two given terms.**

8. a4 = 3, a6 = 9

9. Find the seventh term of the geometric sequence whose second and third terms are 2 and $-\sqrt{2}$.

10. Given a geometric sequence with a4 = 4 and a7 = 12, find r and a10.

**Find the sum.**

11. $\sum\_{k=1}^{10}3^{k}$ 12. $\sum\_{k=1}^{9}(-\sqrt{5} )^{k}$ 13. $\sum\_{k=0}^{9}(-\frac{1}{2})^{k+1}$

**Express the sum in terms of summation notation.**

14. 2 + 4 + 8 + 16 + 32 + 64 + 128 15. $\frac{1}{4}- \frac{1}{12}+ \frac{1}{36}-\frac{1}{108}$

**Find the sum of the infinite geometric series if it exists.**

16. 1 - $\frac{1}{2}$ + $\frac{1}{4}$ - $\frac{1}{8}$ + … 17. 1.5 + 0.015 + 0.00015 + … 18. 256 + 192 + 144 + 108 + …

19. Find the geometric mean of 12 and 48.

20. Insert two geometric means between 4 and 500.

21. If a deposit of $100 is made on the first day of each month into an account that pays 6% interest per year compounded monthly, determine the amount in the account after 18 years.

22. Shown in the figure is a family tree displaying the current generation (you) and 3 prior generations, with a total of 12 grandparents. If you were to trace your family history back 10 generations, how many grandparents would you find?

You

Mother

Father