Secondary III 8-2 HW
Finite Geometric Series

Name: Key

Find the sum of the finite geometric series.

3. $-3+6-12+24-48+96-192+384$

$r=-2 \quad a=-3 \quad n=8$

$f(8) = -3(-2)^{n-1}$

255

4. $6-4+\frac{8}{3}-\frac{16}{9}+\frac{32}{17}$

$r=-2/3 \quad a=6 \quad n=5$

4.07

Determine how many terms the geometric series has, and then find the sum of the series.

5. $-12-4-\frac{4}{3}-\cdots-\frac{4}{243}$

$r=\frac{1}{3}$

$\frac{-4}{243} = -12(1/3)^{n-1}$

$\frac{1}{729} = \frac{1}{3}^{n-1}$

$(\frac{1}{3})^6 = \frac{1}{3}^{n-1}$

$6 = n-1$

$n=7$

$\sum_{n=1}^{7} -12(\frac{1}{3})^{n-1} = -17.99$

6. $0.3+0.03+0.003+\cdots+0.000003$

$r=\frac{1}{10}$

$.000003 = .3(\frac{1}{10})^{n-1}$

$.00001 = (\frac{1}{10})^{n-1}$

$(\frac{1}{10})^5 = (\frac{1}{10})^{n-1}$

$5 = n-1$

$n=6$

$\sum_{n=1}^{6} .3(\frac{1}{10})^{n-1} = .333333$

8. $-3+9-27+\cdots-177{,}147$

$r=-3$

$-177{,}147 = -3(-3)^{n-1}$

$59049 = (-3)^{n-1}$

$(-3)^{10} = (-3)^{n-1}$

$10 = n-1$

$n=11$

$\sum_{n=1}^{11} -3(-3)^{n-1} = -132861$

Write the finite geometric series from its given description, and then find its sum.

9. A geometric series that starts with 2, ends with -6250, and has a common ratio of -5

$-6250 = 2(-5)^{n-1}$

$-3125 = (-5)^{n-1}$

$(-5)^5 = (-5)^{n-1}$

$n=6$

$\sum_{n=1}^{6} 2(-5)^{n-1} = -5208$

10. A geometric series with 5 terms that begins with 1 and has a common ratio of $\frac{1}{3}$.

$\sum_{n=1}^{5} 1\cdot(\frac{1}{3})^{n-1} = 1.49$

11. A geometric series with 7 terms that begins with 1000 and successively decreases by 20%. $1-.2=.8$

$\sum_{n=1}^{7} 1000(.8)^{n-1} = 3951.424$

13. Chess The first international chess tournament was held in London in 1851. This single-elimination tournament (in which paired cometitors played matches and only the winner of a match continued to the next round) began with 16 competitors. How many matches were played?

$\sum_{n=1}^{4} 8(\frac{1}{2})^{n-1}$ = 15 matches

16. Finance A person deposits $5000 into an investment account at the end of each year for 10 years. The account earns 4% interest annually. What is the future value of the annuity after the 10th deposit?

$a_1 = 5000$
$r = 1.04$
$n = 10$

$\sum_{n=1}^{10} 5000(1.04)^{n-1} = \$60,030.54$

18. Match each finite geometric series on the left with its sum on the right.

A. $2 + 6 + 18 + \cdots + 1458$ ___B___ 1094

B. $2 - 6 + 18 - \cdots + 1458$ ___D___ −2186

C. $-2 + 6 - 18 + \cdots - 1458$ ___A___ 2186

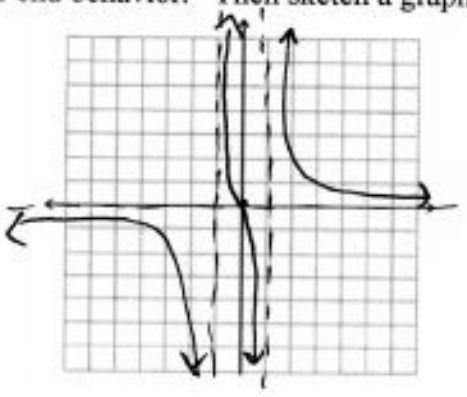
D. $-2 - 6 - 8 - \cdots - 1458$ ___C___ −1094

Review

Find any holes, asymptotes, and intercepts and state the end behavior. Then sketch a graph.

1. $f(x) = \dfrac{x}{(x+1)(x-1)}$

holes: n/a
VA: $x = 1, -1$
x-int: (0,0)
y-int: (0,0)
HA: $y = 0$



2. $h(x) = \dfrac{4(x+3)}{(x+3)(x-2)}$

hole: $x = -3$
VA: $x = 2$
x-int: n/a
y-int: (0, -2)
HA: $y = 0$