

HONORS ALGEBRA 2
Chapter 11
Test A – Spring, 2009

Name _____
Date _____
Period _____

The solutions are in blue for each problem on the test. Calculators were allowed.

Answer the following given the sequence $a_n = 16, 6, -4, -14, \dots$.

1. Determine if the sequence a_n is arithmetic or geometric.

arithmetic

2. State the common difference or ratio for a_n (based on your answer in #1).

$d = -10$

3. Find the 8th term, a_8 .

$$a_8 = 16 - 10(8 - 1) = -54$$

4. Calculate the 8th-partial sum, S_8 .

$$S_8 = \frac{8}{2}(16 - 54) = -152$$

5. Find the infinite sum, S , if it exists.

The infinite sum does not exist since $S \rightarrow -\infty$.

Answer the following given the sequence $b_n = 32, -8, 2, -0.5, \dots$.

6. Determine if the sequence b_n is arithmetic or geometric.

geometric

7. State the common difference or ratio for b_n (based on your answer in #6).

$r = -1/4$

8. Find the 7th term, b_7 .

$$b_7 = 32 \left(-\frac{1}{4}\right)^{7-1} = \frac{1}{128}$$

9. Calculate the 7th-partial sum, S_7 .

$$S_7 = \frac{32 \left[1 - \left(-\frac{1}{4}\right)^7 \right]}{1 - \left(-\frac{1}{4}\right)} = \frac{3277}{128} \approx 26.602$$

10. Find the infinite sum, S , if it exists.

$$S = \frac{32}{1 - \left(-\frac{1}{4}\right)} = \frac{128}{5} = 25.6$$

Suppose a sequence 108, ____, ____, -4. Answer the following.

11. Find the arithmetic means for the sequence.

$$108 + 3d = -4 \Rightarrow d = -\frac{112}{3}$$

$$\text{Therefore: } 108, \frac{212}{3}, \frac{100}{3}, -4$$

12. Find the geometric means for the sequence.

$$108 \cdot r^3 = -4 \Rightarrow r = -\frac{1}{3}$$

$$\text{Therefore: } 108, -36, 12, -4$$

Answer the following.

13. Suppose $a_{n+1} = a_n - 3n$ for $n \geq 1$. If $a_1 = 0$, find a_4 .

$$a_2 = a_1 - 3(1) = 0 - 3 = -3$$

$$a_3 = a_2 - 3(2) = -3 - 6 = -9$$

$$a_4 = a_3 - 3(3) = -9 - 9 = -18$$

14. Find the polynomial expansion of $(x - 3)^4$.

$$\begin{aligned} & [1 \cdot x^4 \cdot (-3)^0] + [4 \cdot x^3 \cdot (-3)^1] + [10 \cdot x^2 \cdot (-3)^2] + [4 \cdot x^1 \cdot (-3)^3] + [1 \cdot x^0 \cdot (-3)^4] \\ & x^4 - 12x^3 + 90x^2 - 108x + 81 \end{aligned}$$

For each series, find the sum.

15. $\sum_{k=3}^{15} (2k - 3)$ a. 27 b. 180 **c. 195** d. 225

16. $\sum_{i=0}^4 24 \left(-\frac{1}{2}\right)^i$ a. 15 b. 16 **c. 16.5** d. 17

17. $\sum_{p=0}^3 \frac{p^2}{p!}$ a. 3.83 **b. 4.5** c. 5.5 d. undefined

18. $\sum_{j=1}^{10} (-5 + Aj)$ a. $10A - 5$ b. $49.5A - 45$ **c. $55A - 50$** d. $60.5A - 55$

19. $\sum_{m=0}^{\infty} \frac{1}{3} \left(\frac{7}{5}\right)^m$ a. $-7/6$ b. $-16/15$ c. $-5/6$ **d. diverges**

20. $\sum_{n=1}^{\infty} 2.3(0.8)^{n-1}$ a. 1.5 b. 9.2 **c. 11.5** d. diverges