

Pre-Calculus Sec. 10.1, 10.2, 10.3 & 10.5 Review Worksheet #1

Determine whether the sequence is arithmetic, geometric, or neither. Then find the apparent n^{th} term.

1. 2, -3, -8, -13...
2. -3, 0, 5, 12, 21...
3. 4, 6, 9, $\frac{27}{2}$...
4. 10, 7, 4, 1, -2...
5. 4, -2, 1, $\frac{-1}{2}$...
6. 2, 8, 18, 32, 50, 72...

Evaluate the given factorial expressions below.

$$7. \frac{11! \cdot 4!}{6! \cdot 10!} \qquad 8. \frac{(n+1)!}{(n-1)!}$$

Express each repeating decimal below as

- a) an infinite geometric series
- b) a fraction

9. $1.\bar{7}$
10. $0.\bar{36}$
11. $0.4\bar{5}$

Use sigma notation to represent each series below. Then find the sum, if possible.

12. $3 + 5 + 7 + 9 + 11 + 13$
13. $2 + \frac{2}{9} + \frac{2}{81} + \dots$
14. $9 - 18 + 36 - 72 \dots$
15. $3 + 7 + 11 + 15 + 1$

16. Given an arithmetic sequence with $a_8 = 25$ and $a_{20} = 61$, find a_{30} .

17. Given a geometric sequence with $a_3 = 12$ and $a_6 = 96$, find a_{11} .

18. Find the sum of the first 12 positive 3 digit integers ending in 4.

19. Find the sum of the first 203 positive odd integers.

20. Generate the first 5 terms of the sequence: $a_{n+1} = a_n + (a_{n-1})^2 - 5$ if $a_1 = 3$ and $a_2 = 2$.

21. In the arithmetic sequence $a_5 = 6$ and $a_{11} = 36$, find the first 4 terms.

22. Find S_8 of the series: $4 - \frac{4}{3} + \frac{4}{9} - \frac{4}{27} + \dots$

23. Evaluate $\sum_{n=1}^6 3(4)^{n-1}$

24. Evaluate $\sum_{i=1}^7 (-1)(2-i)^2$

Ch 10 Review WS #1 Answers

1. Arithmetic; $a_n = 7 - 5n$

2. Neither; $a_n = n^2 - 4$

3. Geometric; $a_n = \frac{8}{3} \left(\frac{3}{2}\right)^n$

4. Arithmetic; $a_n = 13 - 3n$

5. Geometric; $a_n = -8 \left(-\frac{1}{2}\right)^n$

6. Neither; $a_n = 2n^2$

7. $\frac{11}{30}$

8. $n^2 + n$

9.

$1 + [0.7 + 0.07 + 0.007 + \dots]$ or

a. $1 + \left[\frac{7}{10} + \frac{7}{100} + \frac{7}{1,000} + \dots \right]$

b. $\frac{16}{9}$

10.

$0.36 + 0.0036 + 0.000036 + \dots$ or

a. $\frac{36}{100} + \frac{36}{10,000} + \frac{36}{1,000,000} + \dots$

b. $\frac{4}{11}$

11.

$0.4 + [0.05 + 0.005 + 0.0005 + \dots]$ or

a. $\frac{4}{10} + \left[\frac{5}{100} + \frac{5}{1000} + \frac{5}{10,000} + \dots \right]$

b. $\frac{41}{90}$

12.

a. $\sum_{n=1}^6 2n + 1$

b. 48

13.

a. $\sum_{n=1}^{\infty} 18 \left(\frac{1}{9}\right)^n$

b. $\frac{9}{4}$

14.

a. $\sum_{n=1}^{\infty} -\frac{9}{2} (-2)^n$

b. No Sum!

15.

a. $\sum_{n=1}^5 4n - 1$

b. 55

16.91

17.3072

18.1908

19.41,209

20. $a_1 = 3, a_2 = 2, a_3 = 6, a_4 = 5, a_5 = 36$

21. $-14, -9, -4, 1$

22. $S_8 = \frac{6560}{2187}$ 23. 4095 24. -56