Name _____

1. Which term of the arithmetic sequence 3, 8, 13,18,23, …, 113 is 113?

A) 20th   B) 21st   C) 22nd   D) 23rd

2. Find the 27th term in the arithmetic sequence –8, 1, 10, …

A) 174   B) 226   C) 235   D) 242

3. In an arithmetic sequence, what is d if $a_1 = 14$ and $a_{24} = 50.8$?

A) 1.6   B) 2.1   C) 2.6   D) 3.6

4. Find S_{73} in the arithmetic series $-0.2 + 0.3 + 0.8 + \ldots$.

A) 3186   B) 1306.7   C) 1299.4   D) 1317.65

5. An employee's salary increases by the same amount each year. If he earned $77,900 for the seventh year and $97,500 for the fifteenth year, how much was his pay for the second year?

A) $61,100   B) $63,200   C) $63,900   D) $65,650

6. Write $\sum_{n=2}^{4} 5(\frac{2}{3})^n$ in expanded form and then find the sum.

A) $5\left(\frac{4}{9}\right) + \left(\frac{4}{9}\right) + \left(\frac{4}{9}\right); \frac{28}{9}$

C) $5\left(\frac{2}{3}\right)^1 + 5\left(\frac{2}{3}\right)^2 + 5\left(\frac{2}{3}\right)^3; \frac{190}{27}$

B) $\left(\frac{10}{3}\right)^2 + \left(\frac{10}{3}\right)^3 + \left(\frac{10}{3}\right)^4; \frac{15,700}{81}$

D) $\left(\frac{20}{9}\right) + \left(\frac{40}{27}\right) + \left(\frac{80}{81}\right); \frac{380}{81}$

FORMULAS:

$a_n = a_1 + (n-1)d$

$S_n = \frac{n}{2}(a_1 + a_n)$

$a_n = a_1(r)^{n-1}$

$S_n = a_1\left(\frac{1-r^n}{1-r}\right)$

$S = \frac{a_1}{1-r}$

7. Express the series $0.7 + 0.007 + 0.00007 + \ldots$ using sigma notation.

8. Given $a_3 = -16$ and $a_{27} = -304$ in an arithmetic sequence, find a_{64}.

9. Find the sum of $3 - 1 + \dfrac{1}{3} - \dfrac{1}{9} + \ldots$

10. Find the 40th term of the arithmetic sequence $7, \dfrac{22}{5}, \dfrac{9}{5}, -\dfrac{4}{5}, \ldots$.

11. If a_1 is 6 and $a_{13} = -42$, find the common difference d.

12. Write the arithmetic series using summation notation and then find the sum of the first 30 terms of $10 + 6.8 + 3.6 + \ldots$

13. An employee agreed to a salary plan where his annual salary increases by the same amount each year. If he earned $51,100 for the fifth year and $64,900 for the eleventh year, how much will he have earned in total after 25 years at his job?

14. Find the sum of the first eight terms in the geometric series $64 - 32 + 16 - 8 \ldots$.

15. Write $\sum_{n=2}^{7} 81(-\frac{1}{3})^{n-2}$ in expanded form. Then find the sum.

16. Find n for $8+5+2+-1........$, where $a_n = -40$.

17. In a geometric series, $t_3 = 9$ and $t_6 = 30.375$, find S_{17}.

18. Find n for $5 - 15 + 45 - 135 ....$ If $S_n = 2735$

19. Use the series: $2 + 3 + 4 + 5 + 6 + ...$ find n when $S_n = 5150$.

20. Determine if each of the following series converges or diverges.

a. $18, 28, 38, 48, ...$

b. $-3, \frac{12}{5}, -\frac{48}{25}, \frac{192}{125}...$

c. $81, 27, 9, 3, ...$

d. $\sum_{n=1}^{\infty} \frac{16}{9}(\frac{3}{2})^{n-1}$