1) An arithmetic sequence has $u_{10} = 78$ and $u_{16} = 54$. What is u_1?

a. 101
b. 105
c. 109
d. 114
e. 120

2) A geometric sequence is defined by $u_1 = 162$ and $u_{n+1} = \frac{u_n}{3}$. What is its 7^{th} term?

a. 0.078
b. 0.089
c. 0.091
d. 0.111
e. 0.222

3) Evaluate $1 - 2 + 4 - 8 + 16 + \ldots - 512$.

a. 432
b. 176
c. 171
d. –80
e. –341

An arithmetic sequence is given by $u_n = 46 - 7n$. Find:

4) ... the sum of its first 14 terms.

a. −91
b. −88
c. −85
d. −80
e. −72

5) ... the 28^{th} term of this sequence.

a. −136
b. −143
c. −150
d. −157
e. −164

6) What is the constant ratio of the geometric series with $u_3 = 99, u_5 = 11$?

a. $\frac{1}{\sqrt{3}}$
b. $\frac{1}{3}$
c. 3
d. $\frac{1}{2}$
e. $\sqrt{3}$

7) $\sum_{k=1}^{\infty} 7(\frac{5}{7})^n =$

a. 16.5
b. 16.7
c. 17.3
d. 17.5
e. 18.3

8) $\sum_{k=1}^{12} 16 - \frac{3}{2}n =$

a. 75
b. 78
c. 84
d. 88
e. 91

9) Evaluate $216 + 144 + 96 + 64 \ldots +$

a. 684
b. 672
c. 654
d. 648
e. 623

10) Evaluate $\sum_{i=4}^{10} 3i - 5$.

a. 128
b. 124
c. 120
d. 116
e. 112

11) What is the 15^{th} term of the series described by $\sum_{i=1}^{25} 85 - 3n$?

a. 49
b. 48
c. 45
d. 42
e. 40

12) Evaluate $\sum_{i=1}^{25} 85 - 3n$.

a. 1,153
b. 1,150
c. 1,147
d. 1,050
e. 1,047

A geometric series with the first term 144 has a sum to infinity of 192. Find:

13) ... the constant ratio.

a. 0.8
b. 0.75
c. 0.5
d. 0.25
e. 0.11

14) ... u_5.

a. 0.1625
b. 0.325
c. 0.5625
d. 0.75
e. 0.825

15) Express this series in sigma notation: 36, 9, 2.25...

a. $\sum_{n=0}^{\infty} 36\ \frac{1}{4}^{\ n}$
b. $\sum_{n=0}^{\infty} 36\ \frac{1}{2}^{\ n}$
c. $\sum_{n=1}^{\infty} 36\ \frac{1}{4}^{\ n}$
d. $\sum_{n=0}^{\infty} 9\ \frac{1}{4}^{\ n}$
e. $\sum_{n=0}^{\infty} (\frac{1}{9})^n$

16) A sequence has the recursive formula $u_{n+1} = u_n + 8$ and $u_1 = 12$. What is an expression for u_n?

a. $8n + 4$
b. $4 - 8n$
c. $12 - 8n$
d. $8 - 4n$
e. $4n + 12$

17) An arithmetic sequence has a constant difference of 2.5 such that $u_{21} = 18$. What is u_1?

a. –2
b. –4
c. –8
d. –16
e. –32

18) At which term does the arithmetic sequence 4, 11, 18, 25... exceed 100?

a. u_{11}
b. u_{12}
c. u_{13}
d. u_{14}
e. u_{15}

19) Sum the positive terms of the arithmetic sequence 85, 78, 71, ...

a. 535
b. 539
c. 554
d. 559
e. 571

20) A geometric series is defined by $u_n = 5(\frac{2}{5})^n, n \geq 1$. What is the sum of its first 5 terms?

a. 3.1
b. 3.3
c. 3.5
d. 3.7
e. 3.9

21) What is the sum of the infinite geometric series defined by $u_n = 5(\frac{2}{5})^n$?

a. 3.9
b. 3.7
c. 3.5
d. 3.3
e. 3.1

22) Given $u_n = 5(\frac{2}{5})^n$, find u_{10}.

a. 0.000875
b. 0.00125
c. 0.000524
d. 0.00275
e. 0.01005

Consider the series $\sum_{i=1}^{12} 18 - \frac{2}{3}n$. Find:

23) ... the last term.

a. 8
b. 9
c. 10
d. 11
e. 12

24) ... the series solution.

a. 272
b. 236
c. 200
d. 182
e. 164

25) Find u_{15} of the arithmetic sequence with $u_3 = 94$ and $u_{20} = 9$.

a. 30
b. 32
c. 33
d. 34
e. 36

26) What is u_1 of the infinite geometric series that sums to 125 and has a constant ratio of 0.8?

a. 23
b. 25
c. 26
d. 28
e. 29

27) A geometric series with 8 terms has $u_1 = 24$ and $u_8 = 0.1875$. Find its series solution.

a. 47.8
b. 47.9
c. 49.1
d. 49.3
e. 49.4

28) A series is described by $u_n = \frac{4}{9}n + 110$. What is the sum of its first 9 terms?

a. 970
b. 980
c. 990
d. 1,010
e. 1,020

29) What is the FIRST negative term of the arithmetic series 74, 68, 62...?

a. –1.5
b. –2
c. –2.5
d. –3
e. –4

Consider the series 486 – 162 + 54 – 18 ....

30) What is the common ratio ?

a. $-\frac{2}{3}$
b. $-\frac{1}{2}$
c. $-\frac{1}{3}$
d. $-\frac{1}{5}$
e. $-\frac{1}{4}$

31) Evaluate 486 – 162 + 54 – 18 ... .

a. 372.5
b. 364.5
c. 360.5
d. 352.5
e. 344.5

32) An arithmetic series has the first and last terms $u_1 = 3, u_{16} = 23$. What is the sum of series?

a. 230
b. 224
c. 218
d. 212
e. 208

An arithmetic sequence has a second term 7. Its first four terms sum to 12. Find:

33) ... its constant difference formula.

a. −5
b. 4
c. 2
d. −8
e. −6

34) ... its 20^{th} term.

a. –137
b. –125
c. –113
d. –119
e. –128

35) ... its partial sum of series S_{20}.

a. –1,083
b. –1,220
c. –1,309
d. –1,418
e. –1,490