

Lecture 1.2: LO 1.2.7, 1.2.8, 1.2.9

1. The second, seventh, and twelfth terms an arithmetic sequence are 15, 55, and 95, respectively. Find the first term, common difference, and the sum of the first ten terms of the sequence.
 - a. $a = 7, d = 8, S_{10} = 430$
 - b. $a = 7, d = 8, S_{10} = 86$
 - c. $a = 8, d = 7, S_{10} = 430$
 - d. $a = 8, d = 7, S_{10} = 79$
 - e. $a = 7, d = 8, S_{10} = 395$

2. Find the first five terms of the sequence $a_n = 3(a_{n-1} + 1)$, where $a_1 = 1$
 - a. $a_1 = 1, a_2 = 6, a_3 = 21, a_4 = 66, a_5 = 201$
 - b. $a_1 = 3, a_2 = 9, a_3 = 27, a_4 = 69, a_5 = 226$
 - c. $a_1 = 3, a_2 = 12, a_3 = 15, a_4 = 18, a_5 = 21$
 - d. $a_1 = 1, a_2 = 7, a_3 = 22, a_4 = 67, a_5 = 202$
 - e. None of the above

3. The first term of the arithmetic sequence is $\frac{2}{3}$ and the common difference is $(-\frac{2}{3})$. Which term of this sequence is $-\frac{20}{3}$?
 - a. 10th term
 - b. 12th term
 - c. 13th term
 - d. 16th term
 - e. 6th term

Additional Questions: Recurrence relationships & series

4. A sequence is generated by the recurrence relation, $u_{n+1} = 3u_n - 2k$, $u_1 = -1$. Given that $u_3 = 7$, find the value of k .
- a. -2
 - b. 0
 - c. 1
 - d. -1
 - e. ± 2
5. A polygon has 30 sides, the lengths of which, starting from the smallest side are in an arithmetic progression. If the perimeter of the polygon is 1800 cm and the length of the longest side is 11 times that of the shortest side a , find the length of the shortest side, in cm and the common difference d , of the arithmetic progression.
- a. $a = \frac{72}{7}$, $d = \frac{24}{7}$
 - b. $a = 10$, $d = \frac{100}{29}$
 - c. $a = 10$, $d = \frac{10}{3}$
 - d. $a = 11$, $d = \frac{110}{29}$
 - e. $a = 11$, $d = \frac{10}{3}$
6. The second and fifth terms in an arithmetic series are $\ln(x^3)$ and $\ln(x^6)$. Find the sum of the first 10 terms of the series.
- a. $\ln(x^{55})$
 - b. $\ln(x^{45})$
 - c. $\ln(x^{65})$
 - d. $\ln(x^{66})$
 - e. $\ln(x^{44})$

Additional Questions: Recurrence relationships & series

7. The sum of the first 16 terms of an arithmetic progression is identical to the sum of the first 10 terms. If the common difference is -3 find the first term.
- a. $\frac{75}{2}$
 - b. $\frac{-63}{2}$
 - c. $\frac{63}{2}$
 - d. $\frac{75}{4}$
 - e. $\frac{-75}{2}$
8. In a sequence, $u_1 = 6$, $u_2 = 7$ and $u_3 = 8.5$. If the recurrence relation is in the form $u_{n+1} = au_n + b$, find the values of the constants a and b .
- a. $a = -1.5$, $b = -2$
 - b. $a = 1.5$, $b = 2$
 - c. $a = 2$, $b = -1.5$
 - d. $a = -2$, $b = -1.5$
 - e. $a = 1.5$, $b = -2$