Arithmetic sequences

Some items of this test are multiple choice questions. They are all worth 1 point each. Other items are free response questions, all of them worth 2 points, where any incomplete or imperfect answer will be rewarded.

QUESTIONS	ANSWERS
1. If the numbers 16 and 8 are consecutive terms in an arithmetic sequence (in that order), what is the next term?	❒ 16 ❒ 0 ❒ 4 ❒ -8
2. Consider the arithmetic sequence $(\frac{11}{3}, \frac{8}{3}, \frac{5}{3}, \frac{2}{3}, \ldots)$. The common difference in this sequence is	❒ $\frac{11}{3}$ ❒ -1 ❒ 1 ❒ $-\frac{1}{3}$
3. Consider the arithmetic sequence whose common difference is 5 and first term is 8. Then the tenth term is	❒ 53 ❒ 58 ❒ 85 ❒ 77
4. Consider the arithmetic sequence (a_n) such that $a_1 = 17$ and $a_3 = 23$. The common difference in this sequence is	❒ 6 ❒ -3 ❒ 3 ❒ 17
5. Consider the arithmetic sequence (a_n) such that $a_2 = 117$ and $a_{12} = 187$. The common difference in this sequence is	❒ 70 ❒ -7 ❒ $\frac{70}{9}$ ❒ 7

6. Let (a_n) be an arithmetic sequence of first term a_1 and common difference d.

a. Write any term a_{n+1} as a function of the previous term.

b. Write any term a_n as a function of the first term and the common difference.

c. Let a_n and a_m be two terms in the sequence. Write down the relation between these two terms, using the common difference.

QUESTIONS	ANSWERS
7. The sum of the n first terms of an arithmetic sequence (a_n) is given by the formula	❒ $\frac{a_1 + a_n}{2}$ ❒ $(n+1)\frac{a_1 + a_n}{2}$ ❒ $n \times \frac{a_1 + a_n}{2}$ ❒ $a_1 \times \frac{1+n}{2}$
8. The sum of the 5 first terms of an arithmetic sequence of first term 3 and common difference 0.5 is equal to	❒ 20 ❒ 1.75 ❒ 8 ❒ 25.5
9. Consider an arithmetic sequence such that its first term is $a_1 = -15$ and $a_{100} = 18$. The sum of its one hundred first terms is	❒ 1.5 ❒ 18 ❒ 150 ❒ -270
10. The common difference of the previous sequence is	❒ $\frac{1}{3}$ ❒ $-\frac{1}{3}$ ❒ 33 ❒ 99

Please answer these last two questions on a separate paper, with your name on it.

11. Divide 138 hekats of barley among 8 men so that the common difference is 3/2 hekats of barley.

12. A polygon has 25 sides, the lengths of which form an arithmetic sequence. If the polygon has a perimeter of 1 100 cm, and the longest side is ten times the shortest side, find the lengths of the shortest and longest sides.