



IB GRADED CLASSWORK - SEQUENCES AND SERIES

1. The sum of the first n terms of an arithmetic sequence is $S_n = 3n^2 - 2n$. Find the n th term u_n .
(Total 3 marks)

2. Arturo goes swimming every week. He swims 200 metres in the first week. Each week he swims 30 metres more than the previous week. He continues for one year (52 weeks).

- (a) How far does Arturo swim in the final week?
- (b) How far does he swim altogether?

(Total 6 marks)

3. The ratio of the fifth term to the twelfth term of a sequence in an arithmetic progression is $\frac{6}{13}$.

If each term of this sequence is positive, and the product of the first term and the third term is 32, find the sum of the first 100 terms of this sequence.

(Total 7 marks)

4. Ashley and Billie are swimmers training for a competition.

- (a) Ashley trains for 12 hours in the first week. She decides to increase the amount of time she spends training by 2 hours each week. Find the total number of hours she spends training during the first 15 weeks.

(3)

- (b) Billie also trains for 12 hours in the first week. She decides to train for 10% longer each week than the previous week.

- (i) Show that in the third week she trains for 14.52 hours.

- (ii) Find the total number of hours she spends training during the first 15 weeks.

(4)

- (c) In which week will the time Billie spends training first exceed 50 hours?

(4)

(Total 11 marks)

5. Portable telephones are first sold in the country *Cellmania* in 1990. During 1990, the number of units sold is 160. In 1991, the number of units sold is 240 and in 1992, the number of units sold is 360.

In 1993 it was noticed that the annual sales formed a geometric sequence with first term 160, the 2nd and 3rd terms being 240 and 360 respectively.

(a) What is the common ratio of this sequence? (1)

Assume that this trend in sales continues.

(b) How many units will be sold during 2002? (3)

(c) In what year does the number of units sold first exceed 5000? (4)

Between 1990 and 1992, the total number of units sold is 760.

(d) What is the total number of units sold between 1990 and 2002? (2)

During this period, the total population of *Cellmania* remains approximately 80 000.

(e) Use this information to suggest a reason why the geometric growth in sales would not continue. (1)

(Total 11 marks)