MATEMÁTICAS -- 3º ESO -- IES EDUARDO JANEIRO

Worksheet 3 - Sequences 2-12-2014

Name:……..……

1.- Find the general term of this sequence: 2, 6, 12, 20, 30,...

2.- Calculate the first five terms of the sequence: $3n^2 + 1$

3.- Calculate the general term of this arithmetic progression: 2, 5, 8, 11, 14,...

4. If you know that $a_2 = 8$ and $a_6 = 28$, find the general term of the arithmetic progression.

5. Calculate the sum of the first twenty terms of the sequence: 10, 14, 18, 22,...

6.- Calculate the general term of the geometric progression: 1, 4, 16, 64,...

7.- Knowing that $a_1 = 8$ and $a_3 = 2$, calculate the ratio of this geometric progression

8.- Calculate the sum of the first eight terms of the geometric progression: 1, 3, 9, 27, 81,...

9.- A student decided on 1st of september to start reviewing his Maths during a fortnight, by doing everyday two exercises more than the previous one. If the first day he did an exercise, how many exercises will he do the last day, 15th of september?

10. Write the first five terms of each of these well-known number patterns.

a) Multiples of 3 c) Prime numbers

b) Powers of 2 d) Square numbers over 100

11. Write three more terms for the following sequences and write the Nth terms for each sequences:

a) 20, 40, 60, 80, 100, d) 2, 4, 8, 16, 32,

b) 4, 8, 12, 16, 20, e) 3, 5, 9, 17, 33,

c) 5, 9, 13, 17, 21,

12. Write the first three terms and the 10th term in the following sequences:

$a_n = 7n$ $c_n = 15n-2$

$b_n = 1 + 4^n$ $d_n = 2n^2$

13. Write the first five terms in each of the following sequences, whose first terms and differences are provided. Determine the Nth terms of these sequences:

a) $a_1 = -47$; $d=12$ b) $b_1 = 26$; $d = -4$

14. Find the 86th term of the sequence −11, − 7, − 3, 1, ...

15. Jo has £20 in her piggy bank. In each case, find a rule for the amount of money she will have in the piggy bank after n weeks if she saves:

a) £3 a week b) £5 a week c) £10 a week

16. Caroline has won a prize of 1000 tins of dog food. In each case, find a formula for the number of tins she will have left after n weeks if her dog eats:

a) 5 tins a week b) 7 tins a week c) 14 tins a week

17. The first row in a theatre is 4.5 m from the stage, and the eighth row is 9.75 m.

a) What is the distance between two rows?

b) How far is the 17th row from the stage?

18 An author has signed a contract to write a book of 400 pages. In each case, find a formula for the number of pages left to write after n days if the author writes:

a) 17 pages a day b) 20 pages a day c) 25 pages a day

19. Find the sum of the first ten terms in an arithmetic sequence with a first term of 20 and a difference of 12.

20. Find the first four terms of the following geometric sequences:

a) $a_n = 5^n$ b) $b_n = 5 \cdot (-1)^n$ c) $c_n = \frac{160}{2^n}$

21. Helen tells two of her friends a secret. The next day, each of her friends tells the secret to two other friends. On the next day, their friends each tell the secret to two other friends.

a) How many people are told the secret on the tenth day?

b) Calculate the number of people who were told the secret either before or on the tenth day.

22. Maria has been studying the growth of a tree that was 40 m tall when she began her study. The first year it grew 20 cm, the second year it grew 23 cm and the third year it grew 26 cm. Its growth continued each year following the same pattern.

a) How much did the tree grow in the ninth year?

b) How tall was the tree 9 years after the study began?