

SEQUENCES AND POLYNOMIALS TEST – 3º ESO

Exercise 1: (1 point) Find the general term in the following series:

- a) $\left\{ \frac{4}{3}, \frac{9}{4}, \frac{16}{5}, \frac{25}{6}, \frac{36}{7}, \dots \right\}$
- b) $\{162, 54, 18, 6, 2 \dots\}$
- c) $\{17, 12, 7, 2, -3 \dots\}$

Exercise 2: (1 point) In an arithmetic progression we know that $a_{29} = 303$ and the sum of the first twenty-nine terms equals 4321. Find the general term.

Exercise 3: (1 point) In a GP we know that $a_7 = 364.5$ and $a_{17} = 21523360.5$. Find the general term and the sum of the first twenty-five terms.

Exercise 4: (1 point) In an arithmetic progression we have that $a_1 = 13$ and $a_{32} = -204$. Find the sum of the first fifty terms.

Exercise 5: (1 point) A ball is dropped onto a hard surface from a height of 2m. Every time it bounces, it rebounds to exactly four fifths of the previous height.

- a) Find the general term of the sequence
- b) Work out the values of S_{20} , S_{50} and S_{100}
- c) Describe what happens to the ball, **interpreting** the previous results.

Exercise 6: (1.5 points) Given the polynomials:

$$P(x) = -2x^4 - 5x^3 - 7x^2 + 8$$

$$Q(x) = 9x^4 - x^3 + 3x - 5$$

$$R(x) = 5x - 2$$

Work out the value of the following operations:

- a) $P + Q =$
- b) $Q - P =$
- c) $Q \cdot R =$

Exercise 7: (1 point) Expand these expressions using notable products:

- a) $(5x - 1)^2 =$
- b) $(3x - 2) \cdot (3x + 2) =$
- c) $(3x^2y^5 - 7x^3y^4)^2 =$

Exercise 8: (0.75 points) Take out all the possible common factors:

- a) $12x^4 - 6x^3 + 2x^2 =$
- b) $xy^2z^2 + x^2yz^2 + x^2y^2z =$
- c) $7v^5w^2 - 21v^4w^5 - 49v^2w^3 =$

Exercise 9: (1 point) Evaluate the polynomial $P(x) = 2x^3 - x^2 - 5x + 7$ when:

- a) $x = 2$
- b) $x = -3$

Exercise 10: (0.75 points) Expand $(a + b)^3 =$