

### SERIES AND POLYNOMIALS TEST – 3º ESO

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

a)  $\left\{ \frac{1}{2}, \frac{4}{3}, \frac{9}{4}, \frac{16}{5}, \frac{25}{6} \dots \right\}$

b)  $\{-5, -2, 1, 4, 7 \dots\}$

c)  $\{250, 50, 10, 2, 0.4 \dots\}$

**Exercise 2: (1 point)** In an arithmetic progression we know that  $a_5 = 7$  and  $a_9 = -1$ . Find the general expression of the series and the sum of the first thirteen terms.

**Exercise 3: (1 point)** The first term of a geometric progression is seven and the fourth term is one hundred eighty-nine. Find the general term and the sum of the first fifteen terms.

**Exercise 4: (1 point)** The first term of an arithmetic progression is 7 and the sum of the first seventeen terms equals 1343. Work out the value of the common difference.

**Exercise 5: (1 point)** Andrew must prepare his English exam and he has planned a schedule like this: he will study half an hour tomorrow, the first day, one hour the second day, and he will add thirty minutes every day until the last one, when he wants to study for five hours.

a) How many days are still left until Andrew's exam?

b) How many hours will he study in total if he sticks to his schedule?

**Exercise 6: (1.5 points)** Given the polynomials:

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

$$Q(x) = -7x^4 + x^3 - 5x^2 - 9$$

$$R(x) = 3x^2 - x$$

Work out the value of the following operations:

a)  $P + Q =$

b)  $P - Q =$

c)  $Q \cdot R =$

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

a)  $(x + 7)^2 =$

b)  $(2x - 5)^2 =$

c)  $(3x - 2) \cdot (3x + 2) =$

d)  $(x^2y - z^4)^2 =$

**Exercise 8: (1 point)** Extract all the possible common factors from the next algebraic expressions:

a)  $(9x^4 - 12x^3 + 6x^2) =$

b)  $(x^3yz^2 + x^2y^3z - xy^2z^3 + xyz) =$

c)  $(10v^4w^2 - 25v^3w^4 - 5v^2w^2 + 15v^2w^5) =$

**Exercise 9: (1 point)** Find the numerical value of the polynomial  $P(x) = x^3 - 5x^2 - 7x + 3$  when:

a)  $x = -2$

b)  $x = 0$

**Exercise 10: (0.5 points)** Write a third degree trinomial which principal coefficient is 5 and the constant term equals -9

**Exercise 11: (1 point)** It's up to you

$(a+b)^6 =$