

## SEQUENCES AND POLYNOMIALS TEST - 3<sup>rd</sup> COURSE OF 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  $(a + b)^3 =$