

EXAMEN SEPTIEMBRE- 3º ESO

Exercise 1: Fill in the gaps in this table knowing that the magnitudes represented are inversely proportional. Indicate, also, the value of the constant k .

3		4	1	
	12	6		96

Exercise 2: This table represents the values of a certain random variable. Find the mode, the median, the mean, Pearson's coefficient of variation and draw the frequency polygon.

x_i	[0,2]	(2,4]	(4,6]	(6,8]	(8,10]
f_i	5	9	4	5	2

Exercise 3: In an arithmetic progression we know that $a_9 = 47$ and $a_{20} = 102$. Find the general expression and the sum of the first thirty-five terms.

Exercise 4: In a geometric progression we know that $a_1 = 5$ and $r = 3$. Find the general expression, the value of a_{10} and the sum of the first thirty-two terms.

Exercise 5: Solve these equations

a) $x^2 + 49 = 0$

c) $x^2 + 4x = 0$

e) $x^2 - 4x - 21 = 0$

b) $9x^2 - 16 = 0$

d) $6x^2 - 3 + 4x + 1 = x - 2$

f) $x^2 - 10x + 25 = 0$

Exercise 6: Solve the following simultaneous equations using the indicated method and then classify them.

a) $\left. \begin{array}{l} 2x - 5y = 4 \\ 6x - 15y = -12 \end{array} \right\}$ Elimination

b) $\left. \begin{array}{l} 2x - 3y = 9 \\ 5x - y = -10 \end{array} \right\}$ Substitution

c) $\left. \begin{array}{l} 2x - y = 9 \\ x - 3y = 7 \end{array} \right\}$ Graphically

Exercise 7: Factor these polynomials and indicate their roots

a) $P(x) = x^6 - x^5 - 5x^4 - 3x^3$

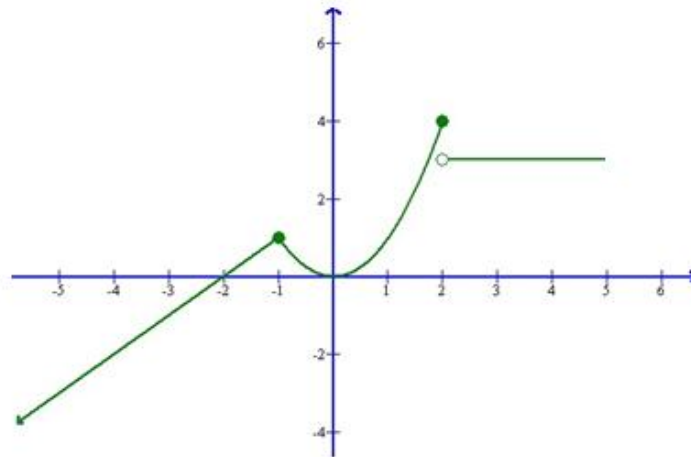
b) $Q(x) = x^4 + 3x^3 + x^2 - 12x - 20$

Exercise 8: Draw the graph of the parabola $y = x^2 - 9x + 18$, indicating its curvature, finding the points where it crosses the axes, its vertex, and making a table with more values if you think it necessary.

Exercise 9: Draw the graph of this piecewise function:

$$f(x) = \begin{cases} x^2 + 2x + 1 & -5 < x \leq -1 \\ 2x + 1 & -1 < x \leq 4 \\ 9 & x > 4 \end{cases}$$

Exercise 10: Given the following graph of a certain function:



- Indicate its domain and its image. Is it a continuous function? Why?
- Determine the points where the function crosses the axes
- Study its monotony
- Study the local and global extrema