

## EQUATIONS TEST 3° ESO



Exercise 1: (0.75 ptos) Find the value of k so that the polynomial  $P(x) = x^4 + kx^3 + 10x^2 + 17x - 18$  is divisible by (x-2) k=-9

Exercise 2: (1.5 ptos) Divide the following polynomials:

a) 
$$(3x^4 - 5x^2 + 3x - 9)$$
:  $(x^2 - 2x) =$  Quotient:  $3x^2 + 6x + 7$  Remainder:  $17x - 9$ 

b) 
$$(x^4 + 9x^2 - 4x - 7): (x + 3) =$$
 Quotient:  $x^3 - 3x^2 + 18x - 58$  Remainder: 167

Exercise 3: (3 pto) Factorize the following polynomials and indicate their roots:

a) 
$$P(x) = x^5 + 9x^4 + 23x^3 + 15x^2$$

Roots: 
$$x = 0$$
 double,  $x = -1$ ,  $x = -3$ ,  $x = -5$   
Factorization:  $x^2(x+1)(x+3)(x+5)$ 

b) 
$$Q(x) = x^5 - x^4 - 13x^3 + 13x^2 + 36x - 36$$

Roots: 
$$x = 1$$
,  $x = -2$ ,  $x = 2$ ,  $x = -3$ ,  $x = 3$   
Factorization:  $(x-1)(x+2)(x-2)(x+3)(x-3)$ 

c) 
$$R(x) = 5x^3 + 3x^2 - 32x + 12$$

Roots: 
$$x = 2$$
,  $x = -3$ ,  $x = 2/5$   
Factorization:  $5(x-2)(x+3)(x-2/5) = (x-2)(x-3)(5x-2)$ 

Exercise 4: (0.75 ptos) I've factorized the polynomial  $P(x) = 2x^5 + 12x^4 + 4x^3 + 5x + 8$  and I got

$$P(x) = 2x^5 + 12x^4 + 4x^3 + 5x + 8 = x(x-3)(x+1)(x+2)$$

Find at least five mistakes

- 1. The degree of the polynomial is five, but you only have four factors
- 2. You can't take x as a common factor
- 3. Three is not a divisor of eight
- 4. There's a two missing at the beginning of the factorization
- 5. All the roots must be negative



Exercise 5: (3.25 ptos) Solve and classify the following systems of equations using the indicated method:

a) 
$$\begin{cases} 2x - y = 11 \\ 3x - 5y = 6 \end{cases}$$
 Substitution

$$x = 7$$
  $y = 3$ 

Consistent independent

c) 
$$5x + 2y = 1$$
  
 $3x + 7y = 2$ 

$$x = 3/29$$
  $y = 7/29$ 

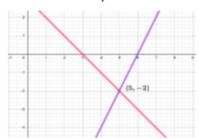
Consistent independent

b) 
$$\begin{cases} 6x - 3y = 9 \\ 10x - 5y = 5 \end{cases}$$
 Elimination

It has no solution, Inconsistent

d) 
$$\begin{cases} x+y=3 \\ 2x-y=12 \end{cases}$$
 Graphical

Consistent independent



<u>Exercise 6:</u> (0.75 pto) In a restaurant they have tables for three people and tables for four people. If they have a total of nineteen tables and they can sit a total of sixty-nine people, how many tables of each type are there?

PS: Due to the coronavirus pandemic, all the four-people tables are outside.

There are seven tables for three people and twelve tables for four people

