Plan de recuperación de septiembre – Matemáticas de 2º de ESO – Plurilingüe

Segundo trimestre

1) Write the following statements using algebraic language.

The double of a number plus three times another number	The fifth of a number	The diferrence of two numbers is 15	The fourht of a number plus three times the same number
The quotient of two numbers	The fifth of the sum of two numbers	The half of a number plus its square	The half and the fifth parts of a number is 17

2) Translate these algebraic expressions into English.

2 x	
2·(p + q)	
a + b = 6	
$\frac{x}{4}=10$	
$\frac{y}{2}+\frac{y}{3}$	
$\frac{b}{4}+10=12$	

3) Realiza las siguientes operaciones y escribe el grado del monomio resultante.

		Grado
a) $(-2ab)\cdot(3a^2b^2)\cdot(-ab)=$		
b) $(8m^3n^2g^4):(2mng)=$		

4) Evaluate the following expression. (Replace the variables by the values indicated)

a) $P(x) = -x^2 + 3x - 7$, when $x = -1$

b) $B(a,b) = 3\,a^2\,b - 4\,a\,b^3 + 7ab$, when $a = 2$ and $b = 3$

5) Robin is four years older than Caroline. Suppose Robin is x years old.

a) Write down an expression for Caroline's age, in years.

Answer: _____

b) The sum of Robin's and Caroline's ages is 21. Which of the following equations states this? Explain your choice.

$2x - 4 = 21$ $x + 4 = 21$ $2x + 4 = 21$ $x - 4 = 21$

Answer: _____

_____

c) Work out Robin's and Caroline's ages.

Answer: Robin is ___ years old. Caroline is ___ years old

6) The width (*anchura*) of a rectangle is w cm. Its length (*longitud*) is double its width.

a) Write down expressions for its length and its perimeter, dependind on the letter "w".

Answer: The width is ___. The length is___. The perimeter is _____

b) The perimeter is 26 cm. What are the values of the width and the length?

Answer: The width is ___ cm long. The length is___cm long.

7) Given the following polynomials:

$P(x) = 4x - 2$
$Q(x) = 3x^2 + 7x - 12$
$R(x) = 5x^2 - 10x + 4$

Do the operations:

a) $x \cdot R(x) - Q(x)$
b) $P(x) \cdot [Q(x) - R(x)]$

8) Find the unknown factor.

a) $4 \cdot \square = 8x$

b) $3 \cdot \square = 9a^2$

c) $\square \cdot 7y = 7y^2$

d) $8s \cdot \square = -24st$

9) Fully factorise.

a) $a^2 – 25 =$

b) $4x^2 – 1 =$

c) $4b^2 – 25 =$

d) $49a^2 – b^2 =$

e) $y^2 – 36x^2 =$

f) $9x^2 – 25y^2 =$

10) Factorise.

a) $x^2 + 2x + 1 =$

b) $x^2 - 6x + 9 =$

c) $x^2 + 20x + 100 =$

d) $x^2 - 12x + 36 =$

e) $x^2 + 14x + 49 =$

f) $x^2 - 18x + 91 =$

11) Fully factorise, extracting first common factors.

a) $3x^2 – 12 =$

b) $900 – 9b^2 =$

c) $10 – 10x^2 =$

d) $x^3 – x =$

12) Fully factorise extracting first common factors.

a) $3x^2 + 30x + 75 =$

b) $27x^2 – 18x + 3 =$

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

d) $2x^2 - 12x + 18 =$

e) $-x^2 + 6x - 9 =$

f) $ax^2 – 10ax + 25a =$

13) Expand the following remarkable identities.

g) $(x+3)^2 =$

h) $(x-4)^2 =$

i) $(x+2)\cdot(x-2) =$

j) $(2x+5)^2 =$

k) $(3x-7)^2 =$

l) $(3x+4)\cdot(3x-4) =$

14) Check if the following values of the unknowns are solutions of the given equations.

Equation	Is it a solution?	Operations	Yes/No
$5x-4=3x$	$x=2$		
	$x=1$		
$3x^2-13=-1$	$x=-2$		
	$x=2$		

15) Solve the following equations.

5x – 7 = 18	3x + 8 - 2x = 17 + 4x - 5	$7(3+2x)=4(2-x)-(4-x)$

16) A rectangle has length 3 m greater than its width. Find the length and the width knowing that the perimeter is 36 cm.

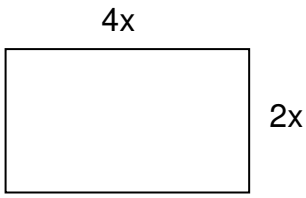
17) Solve the following linear equations:

a) 4x – 2 – 2(x-2) = 0

b) 4·(x+1) -3·(x-2) = 5x+1

c) $2x-1=\frac{2x+1}{2}+\frac{5-2x}{2}$

d) $\frac{5(x-3)}{4} = 2\cdot(3x-4) - \frac{2x+1}{6}$



18) Observa el dibujo, donde las dimensiones del rectángulo están expresadas en función de una letra, x.

a) Find out the algebraic expression of the perimeter of the rectangle.

b) Calculate the value of the perimeter when x equals 3 meters.

c) Find out the algebraic expression of the area of the rectangle.

d) Calculate the value of the area when x equals 5 meters.

19) Write an example:

a) Ecuación de segundo grado completa.	
b) Ecuación de segundo grado incompleta.	

20) Resuelve, de forma rápida, sin utilizar la fórmula cuadrática, las siguientes ecuaciones de segundo grado:

a) $4x^2 - 16 = 0$	b) $x^2 + 9 = 0$
c) $x^2 - 2x = 0$	d) $(x-3) \cdot (x+4) = 0$

21) Solve the following quadratic equations. Check first that they are complete quadratic equations, and then apply the quadratic formula.

a) $x^2 + 4x = 5$

b) $3(x^2 - 2) + 3x = -2x - x^2$

Problem solving using Algebra

22) Two numbers differ by 13 and the sum of their squares is 125. Find the numbers.

23) Tres hermanos se reparten cierta cantidad de dinero. Al mayor le corresponde la mitad, al mediano las 5 sextas partes de lo que queda, y al menor los 300 € restantes. ¿Cuánto dinero se han repartido? ¿Cuánto dinero le corresponde a cada hermano?