ACTIVIDADES PARA MATEMÁTICAS PENDIENTES DE 2º DE ESO

UNIT 1: INTEGERS

1. Compara. Usa <, > o = para completar cada afirmación

a) -6 ____ -3 b) 2 ____ -15 c) -100____ -120 d) -1 ____ 0
e) 2____ -1

2. Calcula:

a) -10 +3 +6 -7 +15 -22 = b) (-28) : (-7) · 2 =

3. Calcula, indicando las operaciones intermedias:

a) -9 + (- 4) – (4 – 8 + 2) = d) 5- 2 ·3 + 4 · (-5 + 15 :3) =

4. When I woke up at 7.00 A.M. it was 10 º C. Then the temperature **rose** 8ºC at 1.00 P.M. After that it **decreased** 7º C. Finally, it decreased 15 º C at midnight. What is the temperature at midnight? **Write the mathematical operation**.

5. Write a **numerical expression** for each of the following. Then **find the result**:

a) You save 100 €, and then spend 75 €, and save 20.

b) A submarine at 10 m below sea level moves up 4 m.

6. Calcula el valor de las siguientes potencias:

a) $(-2)^5$ b) 3^3 c) $(-1)^{5467}$ d) 243^0 d) 10^9

7. Aplicando las **propiedades de las potencias**, expresa como una **única potencia:**

a) $(-3)^5 \cdot (-3)^2 \cdot (-3)^8$ b) $(7^5 : 7^2)^0$

c) $[5^3]^4 : 5^5$ d) $90^7 : 9^7$

8. Descompón en factores primos y luego halla:

a) M.C.D. (240 y 300)

b) m.c.m. (160,180 y 150)

9. Tenemos 220 caramelos de fresa y 100 caramelos de limón. Queremos envasarlos en bolsas que contengan la misma cantidad y lo más grandes posibles.

a) ¿De cuántos caramelos será cada bolsa? Explica tu respuesta.

b) ¿Cuántas bolsas de cada tipo habrá?

10. Find each sum. Then write the same addition in a shorter way.

a) 1 + (-3) + 2 + (-10) b. -250 + 200 + (-100) + 220

11. Real –World Problem Solving (example).

The earthquake monitor in Hockley, Texas, is located in a salt mine at an elevation of -416 m. The elevation of the monitor in Albuquerque, New Mexico, is 2,156 m higher than the one in Hockley. Find the elevation of the monitor in Albuquerque.

-416 + 2156 = 1740

The elevation of the monitor in Albuquerque is 1740 m.

12 The elevation of a monitor in Piñon Flat, California, is 1696 m higher than the monitor in Hockley, Texas. Find the elevation of the monitor in Piñon Flat.

13. Write a numerical expression for each of the following. Then find the sum.

a) You borrow 20 €, and then pay back 18 €.

b) You save 200 €, and then spend 75 €.

c) A man deposits 120€, and then writes a check for 25 €.

d) A submarine at 10 m below sea level moves up 4 m.

14. When I woke up at 7.00 A.M. it was 15 º C. Then the temperature rose 5 º C at 1.00 P.M. After that it decreased 10º C. Finally, it decreased 15 º C at midnight. What is the temperature at midnight?

15. The temperature starts at -10 º C, drops 2º C, drops 5º C, and rises 1º C. Which expression gives the current temperature:

a) (-10) + 2 + 5 + 1 b) -10 + (-2) + (-5) +1

c) 10 + 2 + 5 + (-1) d) 10 + 2 + 5 + 1

16. **Writing and Speaking in Maths:** A friend says that the value of -17 + 5 is – 22. **Explain** how your friend may have made this error.

17. Find the following sums:

a) 5 + 12 – 8 – 13 + 4 b) -15 + 2 – 5 + 20

c) – 32 – 14 + 17 d) - 2 – 3 + 6 – 5 + 12 – 8

UNIT 2: FRACTIONS

1. Reduce a común denominador y ordena las siguientes fracciones de **menor a mayor**:

$$\frac{9}{5}, \frac{7}{10}, \frac{3}{4}, \frac{1}{6}, 1$$

2. Calcula:

a) una fracción equivalente a 5/ 10 cuyo valor en el numerador sea 8.

b) una fracción equivalente a 3 cuyo denominador sea 3.

3. Calcula y expresa el resultado en forma **de fracción irreducible:**

a) $-\frac{10}{25}+\frac{28}{6}-\frac{5}{12}-\frac{21}{35}+1$

b) $\frac{4}{5}\cdot\frac{-3}{2}:\frac{-7}{2}$

4. Realiza las siguientes operaciones con fracciones y expresa la solución como **fracción irreducible**:

a) $\frac{3}{5}:\left[\frac{4}{5}-3\cdot\left(2-\frac{4}{5}\right)\right]$

b) $\left(\frac{1}{4}\right)^2\cdot\frac{2}{3}+\frac{2}{10}:\left(3+\frac{1}{5}\right)$

5. Three quarters of a kilo of ham costs €5,55. How much does one kilo cost?

6. There are 18 girls in a class of 30 pupils.

a) What fraction are girls? Reduce the fraction if possible_____

b) What fraction are boys? Reduce the fraction if possible_____

7. A salesman buys 900 kilos of oranges and sells three fifths of them. How many kilos does he have left?

8. Lesley gave 1/4 of a pizza to her sister, another 1/4 to her mother and **1/3 of the remaining pizza** to her father.

a) [1 p] What fraction of the pizza did the three of them eat?

b) [0,5 p] What fraction of the pizza **is left** for her friend Matt?

9. 1155 runners **started** a marathon but 330 of them **didn´t complete** it. What fraction of the total number of runners **crossed** the finish line?

10. There are 44 boys in 2º ESO in our school. If the total number of students in 2º ESO **is** 91, what fraction of the students **are** girls?

11. One donut **weighs** 52 g. and 24 grams **are** fat (12 g saturated fats). Write the fraction of fat for one donut. One yoghurt **weighs** 125 g. and 5 grams **are** fat. Write the fraction of fat in a yoghourt. Compare that fraction with the fraction of fat in a donut.

12. juan **sells** fruit in a market. Three out of every ten kg of fruit **go** bad. Juan **bought** 6000 kg of fruit this morning in MercaVera. How much fruit does he **have to sell**?

13. Andrea **went** to the cinema with some friends last Saturday. She **had** €15. The ticket **cost** 1/3 of her money. She **spent** a fifth **to buy** a hamburger and the rest on a gift for her sister. How much did each item **cost**?

14. In a survey, 120 pupils **were asked** to **vote** for their favourite subject from English, Science and Math. 1/5 **voted** for English, 1/4 **voted** for Science, and the remainder **voted** for Math. How many more votes **did** Math **receive** than English?

15. Marc **spends** a third of the day asleep. When awake he **spends** 1/8 of his time **playing** on his computer. What fraction of his day **does** Marc **spend** playing on the computer? How many hours **is** this?

16. Yesterday Johnny **bought** a cake that **weighed** 1500 grams. He **ate** 2/5 of it. Today, he **consumed** 1/3 of what was left.

a) What fraction of the cake **has he eaten** in total?

b.) What fraction of the cake **is left**?

c.) How much **does** the remaining cake **weigh**?

UNIT 3: DECIMALS

1. Write how these numbers are read:

a) 0.23 _____

b) 0.624_____

c) 3.081_____

d) 58.36_____

e) 20.11_____

2. Write each as a decimal:

a) three point two _____ b) five point four one _____

c) zero point zero zero one four ____ d) Twenty five hundredths_____

e) Forty-two thousandths_____ f) Three ones and nine hundredths____

g) One hundred and four thousandths

3. **Compare** (using < or >) each pair of decimals:

a) 0.2 0.12 b) 0.89 0.9 c) 0.53 0.5 d) 1.35 1.4

4. **Identify the underlined** place value.

a) 38.<u>4</u>1 b) <u>0</u>.7772 c) 7,098.<u>5</u>6 d) 274.94<u>3</u>4 e) 5.<u>0</u>25

5. Write each as a decimal:

a) eight point zero two _____ b) fifteen point four one nine _____

c) thirty-eight hundredths_____ d) fifty point three seven_____

6. Calcula, indicando los pasos:

a) 302'512 · 0'59 b) 3'548 : 2'7

7. Calcula haciendo todas las operaciones:

a) 10'2 + 0'3·1'42

b) 2'4 · (12'5 – 6'83)

8. Expresa como decimales las siguientes fracciones y di **qué tipo** de decimal se obtiene:

a) $\frac{5}{3}$= b) $\frac{17}{20}$= c) $\frac{7}{12}$=

9. Expresa como fracciones los siguientes números decimales, **viendo antes qué tipo de decimal** es cada uno:

a)0.02 b) 0.2222… c)1.0222…

10.Escribe en notación científica:

a) 60 250 000 000 = b) 0.0000000745 =

Escribe con todas las cifras:

c) $1.24 \cdot 10^{9}$= d) $8.3 \cdot 10^{-8}$ =

11. Find the total cost for this food:

2.1 kg of steak at € 7.78 per kg.

4 dozen of eggs at € 1.05 per dozen

2 litres of milk at € 0.79 per litre

3 cereal boxes at € 2.18 per box

12. Nadine earned $174.25 for working 20.5 h. What was her hourly wage?

UNIT 4: PROPORTIONALITY

1. **EXPLICA Y RESUELVE EL PROBLEMA** Por media sandía que pesaba 3.3 kg he pagado 1.65 € ¿Cuánto pagaré por una sandía que pesa 7 kg?
2. **EXPLICA Y RESUELVE EL PROBLEMA:** Cuatro obreros realizan una obra en 20 días. ¿En cuantos días la pueden terminar 5 obreros?
3. Copia y completa:

	Razón (fracción)	Decimal	Porcentaje
De un billete de 50 € me gasto 34 €			
He recorrido 75 km de los 300 km que tengo que recorrer			

4. **a)** There are 25 students in a class. 10 of them passed all the subjects. Find what percent they represent.

b) 60 % of 25 students pass Math. How many students are they?

5. Isabel went shopping. She bought a € 25 shirt that is on sale for 25% off. How much did she pay at the end?

6. Me han rebajado el precio de un coche de segunda mano en un 12% y he pagado por él 4752 €.

A) ¿Qué porcentaje del precio inicial he pagado?

B) ¿Cuál era el precio inicial del vehículo?

7. Aceituno, dueño de un restaurante, mezcla 3 litros de aceite que cuesta a 4 € el litro con 2 litros de otro aceite de mejor calidad que cuesta a 7 € el litro. ¿A cómo le sale a Aceituno el litro de la mezcla?

8. Amalia ha realizado tres trabajos por los que le han pagado 450 €. Si en el primero empleó 3 días, en el segundo 4 días y en el tercero 2 días, ¿qué cantidad de dinero corresponde a cada uno de los trabajos si le pagan lo mismo al día por cada trabajo?

9. Calculate:

a) 15 % of 200 b) 40 % of 200

c) 6% of 250 d) 30% of 250

e) 10% of 400 f) 10% of 200

g) 25% of 80 h) 25% of 60

i) 50% of 36

j) 50% of 80

10. A cake weighs 1200 grams. 10% of the cake's weight is butter. How many grams of butter are in the cake?

11. In return for helping my brother with a job, he gave me 25% of the €60 he was paid. How much money did he give me?

12. Adela buys a skirt that normally costs €80. When she is going to pay, she finds that they give her a 10% discount. How much is the discount in euros? How much does she pay after the discount?

13. Francisco buys a suit that normally costs €150. But they give him a 20% discount. How much does he pay for the suit?

14. The original selling price of a formal dress was $550. This price was increased by 20%. What was the final selling price?

UNIT 5: ALGEBRA

1. Write an algebraic expression for each sentence:

a) Twice a number
b) The addition of two different numbers
c) Half of a number minus four
d) A number squared plus ten
e) The perimeter of a rectangle with base "b" and height "h".

2. Halla los valores numéricos del polinomio $P(x) = x^2-5x+7$ para $x = 1$ y $x = -2$

3. Haz las operaciones y reduce todo lo que se pueda:

a) $5x \cdot (x^3 – 2x + 5)$
b) $x +3- (3x^2-4x – 2)$

4. Dados los polinomios $A = -3x^2 + 2x - 1$ y $B = x^2 + 3x + 1$ calcula:

a) A + B b) A - B

5. Haz las operaciones siguientes y reduce:

a) $(x+3)^2$
b) $(2x-5)^2$
c) $(3x+1)(3x-1)$

6. Extrae factor común en cada caso:

a) $9x^2 - 6x + 3$ b) $5y^2 - 3y$

7. Usa las identidades notables para expresar como producto o cuadrado:

a) $x^2 – 81$ b) $36x^2 + 36x + 9$

UNIT 6: EQUATIONS AND SYSTEMS

1. Resuelve las siguientes ecuaciones indicando los pasos:

a) $-10x + 15 = 7x + 10 - x + 13$ b) $2(x+4) + 2 = 3(x-5)$

2. Resuelve la ecuación: $\frac{6(x-3)}{5} - 2 = \frac{x-2}{2} + x - \frac{5}{2}$

3. Resuelve la ecuación: $x^2 + x - 2 = 0$

4. Solve the following problem **using equations:**
The perimeter of a rectangle is 28 cm. The base is three times the height. Find the dimensions of the rectangle.

5. Two burgers and three drinks cost €8. Three burgers and four drinks cost €13.50. Find the price of 1 burger and 1 drink.

6. Resuelve el siguiente sistema de ecuaciones por reducción:

$$\begin{cases} 2x+7y=20 \\ 3x-7y=4 \end{cases}$$

7. Resuelve el siguiente sistema por el método que prefieras:

$$\begin{cases} x + 6y = 1 \\ -x - 5y = -2 \end{cases}$$

8. [1.5 p] Representa gráficamente estas dos ecuaciones

y encuentra la solución común a ambas:

$$\begin{cases} y = x + 1 \\ y = 4 - 2x \end{cases}$$

9. The month I was born multiplied by 50 and then added to 100 results 400. In which month was I born?

10. A certain number is divided by 2 and then increased by 4 to get 9. Find the original number.

11. The addition of two consecutive numbers is 113. Find the numbers.

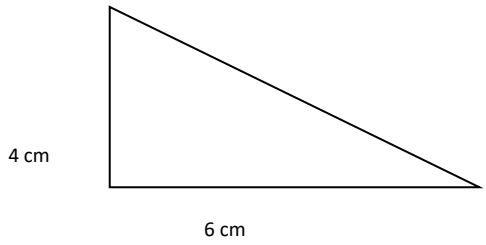
12. How many hens are there in a henhouse if adding legs, crests and beaks we get 88?

13. A pen costs half an Euro more than a pencil. I paid €5 for three pencils and two pens. How much is a pencil? And a pen?

UNIT 7: SIMILARITY AND TRIANGLES

1. Dos triángulos tienen lados que miden: 4 m, 5 m y 6 m; y el otro 2 m, 5 m y 3m. **Explica si son semejantes o no y por qué**.

2. Halla razonadamente el lado desconocido de este triángulo.



3. En un mapa, la escala es 1:1 000 000.

a) Qué distancia real representa una línea de 15 cm?

b) La distancia real entre dos ciudades es de 100 km. ¿Qué distancia habrá en el mapa entre ellas?

4. Haz un dibujo y razona: Un árbol que mide 5 m proyecta una sombra de 6 m, a cierta hora del día, ¿qué altura tendrá un edificio que a esa misma hora proyecta una sombra de 270 m?

5. Find the area and perimeter of:

a) A rectangle measuring 10 cm by 3 cm.

b) A circle with radius 5 cm.

c) An isosceles triangle with base 7 cm and height 2.5 cm.

7. ¿A qué **escala** estamos trabajando en un plano si un segmento de 25 cm representa una distancia sobre el terreno de 1500 m?

8. Calcula la diagonal de un cuadrado de 1 metro de lado. Haz un dibujo-esquema previo y justifica tu resolución.

9.

On a map, the scale is given as 1:50 000.
(a) What real distance does a 1cm line represent in km?
(b) What real distance is represented by a line 8 cm long on the map?
(c) A road is 15 km long. How long would the line on the map be, representing this road?

(a) Pete lives at Rye Farm. How far approximately does he have to walk to school?
(b) John catches the bus. How far is this journey?
(c) How long is the lake in km?