I- Given the system: $\begin{cases} 2x+y=8 \text{.....}(a) \\ 3x-4y=1 \text{.....,.....}(b) \\ mx+(m+1)y=12 \text{.....}(c) \end{cases}$

a. Solve the system formed by the two equations a & b.

b. Calculate the value of m such that the ordered pair that verifies the 1st two equations is a solution of equation (*c*).

II- Solve the following systems:

$a)\begin{cases} 5x+2y=2x+1 \\ 2x-3y=3x+2 \end{cases}$; $b)\begin{cases} \dfrac{2}{2x-1}+\dfrac{3}{z+2}=10 \\ \dfrac{5}{2x-1}-\dfrac{1}{z+2}=8 \end{cases}$; $c)\begin{cases} 3(a^2-1)+2(b^2+1)=58 \\ 2(a^2-1)-5(b^2+1)=-69 \end{cases}$

$d)\begin{cases} \dfrac{2p}{3}-\dfrac{4q}{5}=\dfrac{2+q}{5} \\ 2p=3q \end{cases}$; $e)\begin{cases} 2z-5w=-1 \\ az-(a+1)w=2a-3 \\ z+3w=5 \end{cases}$; $f)\begin{cases} (4n-r)^2+(4n-r)(n+2r)=54 \\ 5n+r=6 \end{cases}$

$g)\begin{cases} x+3y=13 \\ xy=12 \end{cases}$; $h)\begin{cases} y=3x+1 \\ y=6x^2-2x \end{cases}$; $i)\begin{cases} x^2-3y=16 \\ x-y=2 \end{cases}$.

III- A scarf and a jacket will cost Mariam 72 $. The shop offers a 30% sale on the price of the jacket and 10% tax is added to that of the scarf so that the total price will be 66.$.

a. Write the expressions that describes the prices after the increase and the decrease.

b. Determine the initial prices of both items.

IV- Find the real numbers *A* and *B* such that the graphs of the two equations $Ax+2y=2$ and $2x+By=10$ intersect at the point (2;-2).

V- Find the value of *a*, such that the lines: $(d_1): y=2x+7; (d_2): y=-x+1 and (d_3): y=ax-1$ intersect at the same point.

VI- Prove the following equality: $\dfrac{1}{(x-1)}+\dfrac{1}{(x-1)(x-2)}+\dfrac{1}{(x-2)(x-3)}=\dfrac{1}{(x-3)}$.

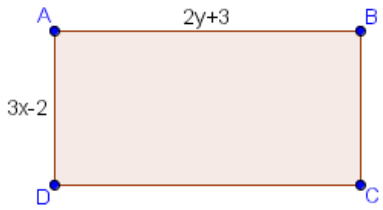
Then deduce the values of the three positive numbers: a, b & c such that: $\dfrac{1}{a}+\dfrac{1}{b}+\dfrac{1}{c}=\dfrac{1}{7}$.

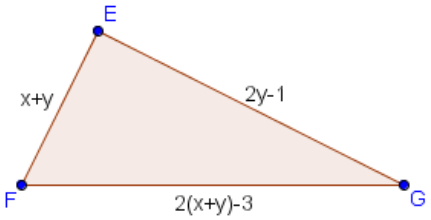
VII- The hypotenuse of a right triangle is greater than one of the other two arms by 10*cm* and the third arm is 70*cm*.

a. Translate the above text into a system of two equations with two unknowns.

b. Solve the formed system to find the length of the hypotenuse.

VIII- The perimeter of the rectangle *ABCD* is 22*cm* and that of the triangle is12*cm*.





a. Prove that the expressions of the peri

b. meters of the two given geometric figures can be translated into the following system of two equations.

$$\begin{cases} 2y+3x=10 \\ 3x+5y=16 \end{cases}$$

c. Solve in $\Re$ the formed system.

d. Find the length of the sides of EFG. Deduce its nature.

IX- *a*) Solve the system: $\begin{cases} \frac{A}{9}=\frac{B}{7} \\ A-3B=-1 \end{cases}$

b) The sum of two fractions is eight times their difference; and three times the smaller exceeds the larger by 1. Find the terms of this fraction.

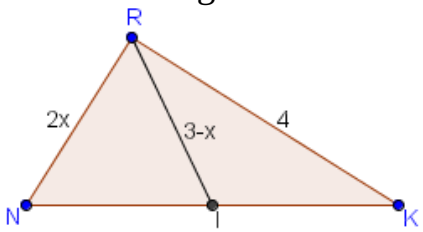
X- Consider the following system:

$$\begin{cases} x+y-35=0 \\ 260-8x=7y \end{cases}$$

a. Find the couple $(x;y)$ that verifies the above system.

b. The fuel and water reserves in a certain power plant is 35 000 liters. After it consumes 20% of the fuel reserve and 30% of the water reserve, the level of the tanks decreases to 26 000 liters. Find the original amount of fuel and water reserves.

XI- In the following figure *x* is expressed in *cm.* Use the figure given below to calculate *x* if *RI* is a median relative to hypotenuse of triangle *RNK*.



XII- At an electronics shop, Rajaa bought memory card and 3 CD's for 30$. From the same shop Fouad bought 2 cards and one CD paid 21$. For a specific reason Khalil took 8 cards and 10 CD's. How much did Khalil pay?

XIII- Use the following table of proportionality to compute *x* & *y*:

$2x-3$	3	$y-5$
$y+1$	4	$x+2$

XIV- A merchant sells mixtures of coffee made up of two types.

Mixture-A: Costs 15$ per kilo and it is made up of 60% Colombian coffee and 40% of Brazilian coffee.

Mixture-B: Costs 13.5$ per kilo and it is made up of 40% Colombian coffee and 60% of Brazilian coffee.

A customer enters the shop and wants to make up his own mixture, which is composed of 30% Brazilian coffee and 70% Colombian coffee.

Assist the merchant to price the formed kilo.

XV- Translate each of the following word problems into mathematical equations without solving them:

a. The difference between 55 and four times a number is equal to fifteen.

b. Nada is 48 years old and her daughter is 6 years old. In how many years will the age of Nada be three times her daughter's?

c. The age of a father is 5 years more than four times the age of his son. After ten years, his age become seven years less than the triple of the age of his son.

d. Jamal's present age is three-fourths of Sara's present age. In five years, Jamal's age will be four-fifths of Sara's age at that time. What are the present ages of Jamal's and Sara?

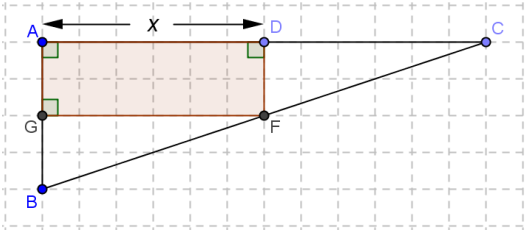
e. Two numbers have a ratio of $\frac{3}{4}$.If the greater is increased by 140, and then the obtained number will be double the smaller.

f. The value of a fraction is $\frac{1}{2}$, if its numerator is reduced by 1 and the denominator is increased by 2. We get the same value if numerator is raised by 1 and the denominator is doubled.

g. Find a two digit number that is three times the sum of its digits, knowing that if we add 45 to this number then its digits will be reversed.

XVI- Sara bought a number of copybooks at Malik's for 150$. If each copybook had been 5$ more, then 5 fewer could have been purchased. Find the price of each copybook. (***Hint***: let x be the number of copybooks and $\$y$ be the cost of each).

XVII- In the below figure: $AB = 2cm, AC = 6cm \& AG = y$. Where $P_{ADFG} = 6cm$. Find $x \& y$.



*XVIII-*In the figure below, the measures are given in *cm*. Compute $x \& y$.