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1).- los digitos serán x, y, z

$x+y+z=17$ ____ (1)

$x^2+y^2+z^2=109$ ____ (2)

$100x+10y+z-495=100z+10y+x$ ____ (3)

$\Rightarrow 99x-99z=495$

$\Rightarrow x-z=5$ sust en (1)

$5+z+y+z=17 \Rightarrow 2z+y=12 \Rightarrow y=12-2z$

sust en (2)

$(5+z)^2+(12-2z)+z^2=109$

$25+10z+z^2+144-48z+4z^2+z^2=109$

$6z^2-38z+60=0$

$z=\frac{38\pm\sqrt{4}}{12}=\frac{38\pm 2}{12}$ $z_1=\frac{10}{3}$ $z_2=3$

$\therefore z=3$ pues debe ser natural

$\Rightarrow y=12-2(3)=6$ $x=5+z=8$

el numero es $\boxed{863}$

2) Calcular $\vec{u} \cdot (\vec{v} \times \vec{w})$

$\vec{u} = (2, -1, 3)$ $\quad \vec{v} = (0, 2, -5)$ $\quad \vec{w} = (1, -1, 2)$

$$\vec{v} \times \vec{w} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & 2 & -5 \\ 1 & -1 & 2 \end{vmatrix} = -\hat{i} - 5\hat{j} - 2\hat{k} = (-1, -5, -2)$$

$$\vec{u} \cdot (\vec{v} \times \vec{w}) = 2(-1) + (-1)(-5) + 3(-2) = -2 + 5 - 6 = \underline{-3}$$

3) $A = \begin{pmatrix} 5 & 5 & 0 \\ 2 & 2 & 1 \\ 3 & 3 & 2 \end{pmatrix}$ $\quad B = \begin{pmatrix} 0 & -1 & -1 \\ -1 & 0 & -1 \\ 0 & 0 & -1 \end{pmatrix}$

$$AB = \begin{pmatrix} -5 & -5 & -10 \\ -2 & -2 & -5 \\ -3 & -3 & -8 \end{pmatrix}$$

$$BA = \begin{pmatrix} -5 & -5 & -3 \\ -8 & -8 & -2 \\ -3 & -3 & -2 \end{pmatrix}$$

4) Calcular el determinante de

$$A = \begin{pmatrix} 3a & 5b & -2c \\ a & 3b & -c \\ -2a & -5b & 2c \end{pmatrix}$$

$$\det A = 3a(6bc - 5bc) - 5b(2ac - 2ac) - 2c(-5ab + 6ab)$$
$$= 3abc - 2abc = \underline{abc}$$

5) Calcular la pendiente de la recta que pasa por $P_1(-3, 1)$ $\quad P_2(-2, -4)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4 - 1}{-2 + 3} = \frac{-5}{1} = -5$$

6) $\lim_{x \to 2} \frac{x^2 - 7x + 10}{x^2 - 4}$.

$$\frac{x^2 - 7x + 10}{x^2 - 4} = \frac{(x-2)(x-5)}{(x-2)(x+2)} = \frac{x-5}{x+2}$$

$$\therefore \lim_{x \to 2} \frac{x^2 - 7x + 10}{x^2 - 4} = \lim_{x \to 2} \frac{x-5}{x+2} = \frac{-3}{4}$$

7) Calcular la derivada de
$f(x) = (x^2 - 2)^2 \cos(3x - 1)$

$$f'(x) = -3(x^2-2)^2 \operatorname{sen}(3x-1) + 4x(x^2-2)\cos(3x-1)$$

8) $X = \{1.015\,kg, 0.975\,kg, 0.986\,kg, 1.01\,kg, 0.992\,kg, 1.024\,kg, 0.984\,kg, 1.021\,kg, 1.013\,kg, 1\,kg\}$?

media $\frac{(1.015 + 0.975 + 0.986 + 1.01 + 0.992 + 1.024 + 0.984 + 1.021 + 1.013 + 1)\,kg}{10}$

$= 1.002\,kg$

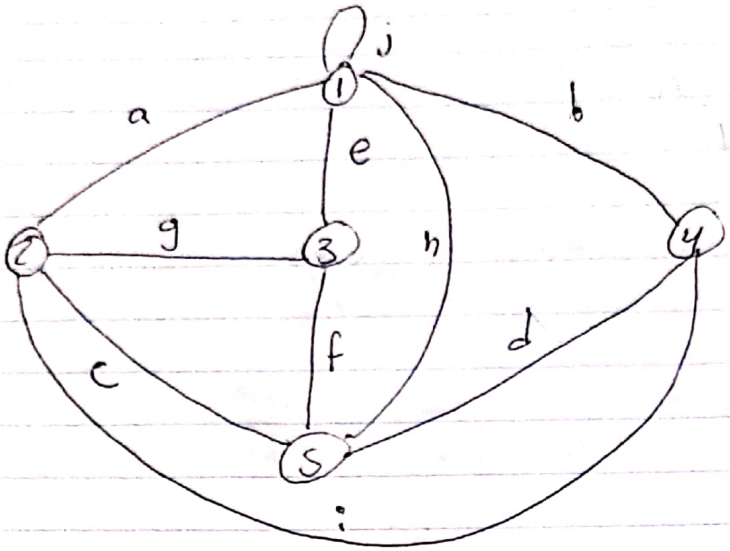
mediana $0.975kg, 0.984kg, 0.986kg, 0.992, \boxed{1, 1.01,} 1.013, 1.015, 1.021, 1.024$

$= \frac{1 + 1.01}{2} = 1.005\,kg$

varianza $\sigma^2 = 0.00026\ kg^2$

desv. estándar $\sigma = \sqrt{0.00026} = 0.016\,kg$

9) Hacer la matriz de adyacencia e incidencia



Adyacencia

	1	2	3	4	5
1	1	1	1	1	1
2	1	0	1	1	1
3	1	1	0	0	1
4	1	1	0	0	1
5	1	1	1	1	0

Incidencia

	a	b	c	d	e	f	g	h	i	j
1	1	1	0	0	1	0	0	1	0	1
2	1	0	1	0	0	0	1	0	1	0
3	0	0	0	0	1	1	1	0	0	0
4	0	1	0	1	0	0	0	0	1	0
5	0	0	1	1	0	1	0	1	0	0

10) $\{(P \vee \sim Q) \wedge [(Q \rightarrow R) \wedge \sim P]\} \leftrightarrow \sim R$

P	q	r	$Q \rightarrow R$	$P \vee \sim Q$	$(Q \rightarrow R) \wedge \sim P$	$(P \vee \sim Q) \wedge [(Q \rightarrow R) \wedge \sim P)$
V	V	V	V	V	F	F
V	V	F	F	V	F	F
V	F	V	V	V	F	F
V	F	F	V	V	F	F
F	V	V	V	F	V	F
F	V	F	F	F	F	F
F	F	V	V	V	V	V
F	F	F	V	V	V	V

$\{(P \vee \sim Q) \wedge [(Q \rightarrow R) \wedge \sim P]\} \leftrightarrow \sim R$

V
F
V
F
V
F
F
V