Purcel Tiberiu Claudiu
Informatică Economică
Gr. 1. 1D

1) $-26x + 7y = -56$

$\frac{1}{4}x + 17y = -8$

$6x - 13y = 126$

$-5x - \frac{1}{2}y = 55$

$-13x + 19y = -39$

Derivatele parțiale de ordinul $\frac{1}{2}$ $f: \mathbb{R}^2 \to \mathbb{R}$

$$f(x,y) = \ln(x^2 + y^2 + 1)$$

$$\frac{\partial f}{\partial x}(x,y) = f'_x(x,y) = \frac{2x}{x^2+y^2+1}$$

$$\frac{\partial f}{\partial y}(x,y) = f'_y(x,y) = \frac{2y}{x^2+y^2+1}$$

$$\frac{\partial^2 f}{\partial x^2}(x,y) = \left(\frac{2x}{x^2+y^2+1}\right)'_x = \frac{2(x^2+y^2+1) - 2x\,2x}{(x^2+y^2+1)^2} =$$

$$= \frac{2(-x^2+y^2+1)}{(x^2+y^2+1)}$$

$$\frac{\partial^2 f}{\partial x \partial y}(x,y) = \left(\frac{2x}{x^2+y^2+1}\right)'_y = 2x\left(-\frac{2y}{(x^2+y^2+1)^2}\right) =$$

$$= -\frac{4xy}{(x^2+y^2+1)^2}$$

$$\frac{\partial^2 f}{\partial y^2}(x,y) = \left(\frac{2y}{x^2+y^2+1}\right)'_y = \frac{2\cancel{(x^2+y^2+1)}}{(x^2+y^2+1)^{\cancel{2}}} =$$

$$= \frac{2}{x^2+y^2+1}$$

9) a) $f(x,y) = 5x^2 + 3y^3$ pct$(1,1)$

$f'_x(x,y) = 10x \Rightarrow \boxed{10}$

$f'_y(x,y) = 9y^2 \Rightarrow \boxed{9}$

b) $f(x,y) = 3x^4 - 5x^2y^3 - 4x^3y^2 - 3y^2 + 4x + 3y + 1$

$f'_x(x,y) = 12x^3 - 10xy^3 - 12x^2y^2 + 4$

$= \cancel{12} - 10 - \cancel{12} + 4 = \boxed{-6}$

$f'_y(x,y) = -15x^2y^2 - 8x^3y - 6y + 3$

$= -15 - 8 - 6 + 3 = \boxed{-26}$

c) $f(p,q) = 4p^3q^2$

$$\frac{\partial f}{\partial p} = 12p^2q^2 = \boxed{12}$$

$$\frac{\partial f}{\partial q} = 8p^3q = \boxed{8}$$

d) $f(k,l) = 4\sqrt{kl^3}$

$$\frac{\partial f}{\partial k} = \cancel{4}\frac{1}{\cancel{2}\sqrt{x}} = \frac{2}{\sqrt{x}} = \boxed{2}$$

$$\frac{\partial f}{\partial l} = 4\sqrt{k}\,l^3 = 12\sqrt{k}\,l^2 = \boxed{12}$$

e) $f(x,y) = \dfrac{x-y}{x+y}$

$$\frac{\partial f}{\partial x} = \frac{(x-y)'(x+y) - (x-y)(x+y)'}{(x+y)^2} =$$

$$= \frac{\cancel{x}+y-\cancel{x}+y}{(x+y)^2} = \frac{2y}{(x+y)^2} = \frac{2}{4} = \boxed{\frac{1}{2}}$$

$$\frac{\partial f}{\partial y} = \frac{(x-y)'(x+y) - (x-y)(x+y)'}{(x+y)^2} = \frac{-(x+y)-(x-y)}{(x+y)^2}$$

$$= \frac{-x-\cancel{y}-x+\cancel{y}}{(x+y)^2} = \frac{-2}{2^2} = \boxed{\frac{1}{2}}$$

f) $f(p,q) = \dfrac{p^2+q^2}{pq}$

$$\frac{\partial f}{\partial p} = \frac{(p^2+q^2)'(pq) - (p^2+q^2)(pq)'}{(pq)^2} = \frac{2p(pq) - 2qp}{(pq)^2} =$$

$$= \boxed{0}$$

$$\frac{\partial f}{\partial q} = \frac{(p^2+q^2)'(pq) - (p^2+q^2)(pq)'}{(pq)^2} = \frac{2q(pq) - 2q(pq)}{(pq)^2}$$

$$= \boxed{0}$$

g) $f(x,y) = \sqrt{xy^3} + \dfrac{2}{x}$

$$\frac{\partial f}{\partial x} = \frac{1}{2x} + \frac{-2x}{x^2} = \frac{1}{2x} - \frac{\overset{2}{2}}{x} = \frac{1-4}{2x} = \frac{-3}{2x} = \boxed{-\frac{3}{2}}$$

$$\frac{\partial f}{\partial y} = \frac{1}{3\sqrt{xy^2}} = \frac{1}{3y\sqrt{x}} = \boxed{\frac{1}{3}}$$

h) $f(s,t) = \dfrac{s+t}{3t} - \dfrac{2s+t^2}{\sqrt{s}}$

$$\frac{\partial f}{\partial s} = \frac{(s+t)' - 3t}{3t^2} - \frac{(2s+t^2)'\sqrt{s} - (2s+t^2)(\sqrt{s})'}{(\sqrt{s})^2} =$$

$$= \frac{1-3t}{3t^2} - \frac{2+t^2 - \frac{1}{2\sqrt{s}}}{(\sqrt{s})^2} = \frac{1-3t}{3t^2} - \frac{2+t^2}{(\sqrt{s})^2} -$$

$$-\frac{1}{2\sqrt{s}} \cdot \frac{1}{(\sqrt{s})^2} = -\frac{2}{9} - \frac{2+1}{1} - \frac{1}{2} = -\frac{2}{9}^{\,2/} - \frac{3}{1}^{\,18/} - \frac{1}{2}^{\,9/} =$$

$$= \frac{-4 - 44 - 9}{18} = \frac{-4 - 3(11+3)}{18} = \frac{-4+11-3}{6} =$$

$$= \boxed{\frac{5}{6}}$$

$$\frac{\partial f}{\partial t} = \frac{(s+t)'\,3t - (s+t)(3t)'}{(3t)^2} - \frac{(2s+t^2)'\sqrt{s} - (2s+t)(\sqrt{s})'}{(\sqrt{s})^2}$$

$$= \frac{3t - 3st}{(3t)^2} - \frac{2t\sqrt{s} - (2s+t)}{(\sqrt{s})^2}$$

$$= \frac{\cancel{3t}(1-s)}{(3t)^{\cancel{2}}}_{(\sqrt{s})^2} - \frac{2t\sqrt{s} - 2s - t}{(\sqrt{s})^2}{}_{3t} =$$

$$= \frac{1-s}{3t} - \frac{2t\sqrt{s} - 2s - t}{(\sqrt{s})^2} =$$

$$= \frac{(\sqrt{s})^2 - s(\sqrt{s})^2 - 6t^2\sqrt{s} + 6st + 3t^2}{3t(\sqrt{s})^2} =$$

$$= \frac{\cancel{1} - \cancel{1} - \cancel{6} + \cancel{6} + 3}{3} = \frac{3}{3} = \boxed{1}$$

i) $f(x,y) = \ln\left(y + \sqrt{x^2+y^2}\right)' = \boxed{\dfrac{1}{y+\sqrt{x^2+y^2}}}$

$$\frac{\partial f}{\partial x} = \frac{1}{y+\sqrt{x^2+y^2}} = \boxed{\frac{1}{1+\sqrt{2}}}$$

$$\frac{\partial f}{\partial y} = \boxed{\frac{1}{\sqrt{2}}}$$

j) $f(x,y,z) = 3x^2 + 2xy + y^2 - 3yz + xz^2 + z^3$

$$\frac{\partial f}{\partial x} = 6x + 2y + z^2 = \boxed{9}$$

$$\frac{\partial f}{\partial y} = 2x + 2y - 3z = \boxed{1}$$

$$\frac{\partial f}{\partial z} = -3y + 2xz + 3z^2 = \boxed{2}$$

k) $f(x,y,z) = x^y + y^z$

$$\frac{\partial f}{\partial x} = yx^{y-1} = \boxed{1}$$

$$\frac{\partial f}{\partial y} = x^y \ln x + zy^{z-1} = x^y \ln x + 1 = 0 + 1 = \boxed{1}$$

$$\frac{\partial f}{\partial z} = (y^z)' = y^z \ln y = \boxed{0}$$

l) $f(p,q,r) = pqr$

$$\frac{\partial f}{\partial p} = (pqr)' = qr = \boxed{1}$$

$$\frac{\partial f}{\partial q} = (pqr)' = pr = \boxed{1}$$

$$\frac{\partial f}{\partial r} = (pqr)' = pq = \boxed{1}$$

m) $f(x,y,z) = 3x^3\sqrt{y^3} \cdot z^2$

$$\frac{\partial f}{\partial x} = 9x^2\sqrt{y^3}z^2 = \boxed{9}$$

$$\frac{\partial f}{\partial y} = 3x^3 \frac{1}{2\sqrt{y^3}} z^2 = {}^{2\sqrt{y^3}}3x^3 \cdot \frac{1}{2\sqrt{y^3}} \cdot {}^{2\sqrt{y^3}}z^2 =$$

$$= \frac{6x^3\sqrt{y^3} + 1 + 2z^2\sqrt{y^3}}{2\sqrt{y^3}} = \frac{6+1+2}{2} = \boxed{\frac{9}{2}}$$

$$\frac{\partial f}{\partial z} = (3x^3\sqrt{y^3}z^2)' = 3x^3\sqrt{y^3}\,2z = 3 \cdot 2 = \boxed{6}$$

n) $f(r,s,t) = \frac{r}{s} + \frac{s}{t} + \frac{t}{r}$

$$\frac{\partial f}{\partial r} = \frac{r' s - r \cdot s'}{s^2} + \frac{t' r - t \cdot r'}{r^2} = \frac{1}{s^2} + \frac{-t}{r^2} =$$

$$= \boxed{0}$$

$$\frac{\partial f}{\partial s} = \frac{r' \cdot s - r \cdot s'}{s^2} + \frac{s' t - s \cdot t'}{t^2} = \frac{-r}{s^2} + \frac{t}{t^2} =$$

$$= -1 + 1 = \boxed{0}$$

$$\frac{\partial f}{\partial t} = \frac{s' \cdot t - s \cdot t'}{t^2} + \frac{t' r - t \cdot r'}{r^2} = \frac{-1}{t^2} + \frac{1}{r^2} =$$

$$= \boxed{0}$$

10)

a) $f(x,y,z) = 3x^2 y^4 z^3$ pct $(1,1,2)$

$$\frac{\partial f}{\partial x} = (3x^2 y^4 z^3)' = 6x y^4 z^3 = 6 \cdot 1 \cdot 1 \cdot 2^3 = \boxed{48}$$

$$\frac{\partial f}{\partial y} = (3x^2 y^4 z^3)' = 3x^2 4 y^3 z^3 = 3 \cdot 1^2 \cdot 4 \cdot 1^3 \cdot 2^3 =$$

$$= 12 \cdot 8 = \boxed{96}$$

$$\frac{\partial f}{\partial z} = (3x^2 y^4 z^3)' = 3x^2 y^4 3 z^2 = 3 \cdot 1^2 \cdot 1^4 \cdot 3 \cdot 2^2$$

$$= 9 \cdot 4 = \boxed{36}$$

b) $f(p,q,r) = 4p^2\sqrt{q}\,r$

$$\frac{\partial f}{\partial p} = 8p\sqrt{q}\,r = 8\cdot 1\cdot 2 = \boxed{16}$$

$$\frac{\partial f}{\partial q} = 4p^2\frac{1}{2\sqrt{q}}\,r = 4\cdot\frac{1}{2}\cdot 2 = \boxed{4}$$

$$\frac{\partial f}{\partial r} = 4p^2\sqrt{q} = \boxed{4}$$

c) $f(x,y,z) = 2x + y - 5z$

$$\frac{\partial f}{\partial x} = \boxed{2}$$

$$\frac{\partial f}{\partial y} = \boxed{1}$$

$$\frac{\partial f}{\partial z} = \boxed{-5}$$

11) a) $f(x,y) = 2x^2y^4$ $\qquad a = (-2, 2)$

$$\frac{\partial f}{\partial x} = 4xy^4 = -8\cdot 2^4 = \boxed{-128}$$

$$\frac{\partial f}{\partial y} = (2x^2y^4)' = 8x^2y^3 = 8\cdot 4\cdot 8 = \boxed{256}$$

$$\frac{\partial^2 f}{\partial x^2} = (4xy^4)'_x = 4y^4 = 4\cdot 2^4 = \boxed{64}$$

$$\frac{\partial^2 f}{\partial y^2} = (8x^2y^3)'_y = 24x^2y^2 = 24\cdot 4\cdot 4 = \boxed{384}$$

$$\frac{\partial f}{\partial x \partial y} = (4xy^4)'_y = 16xy^3 = -32 \cdot 8 = \boxed{-256}$$

$$\frac{\partial^3 f}{\partial x^3} = (4y^4)'_x = \boxed{0}$$ ✓

$$\frac{\partial^3 f}{\partial y^3} = (24x^2y^2)'_y = 48x^2y = 48 \cdot 4 \cdot 2 = \boxed{384}$$

$$\frac{\partial^3 f}{\partial x^2 \partial y} = (4y^4)'_y = 16y^3 = 16 \cdot 8 = \boxed{128}$$

$$\frac{\partial^3 f}{\partial y^2 \partial x} = (24x^2y^2)'_x = 48xy^2 = -96 \cdot 4 = \boxed{-384}$$

b) $f(x,y) = 2\sqrt{x}\,y, \qquad a = (1, 1)$

$$\frac{\partial f}{\partial x} = (2\sqrt{x}\,y)' = \frac{y}{\sqrt{x}} = \frac{1}{1} = \boxed{1}$$

$$\frac{\partial f}{\partial y} = (2\sqrt{x}\,y)' = 2\sqrt{x} = 2 \cdot \frac{1}{2} = \frac{2}{2} = \boxed{1}$$

$$\frac{\partial^2 f}{\partial x^2} = \left(2\frac{1}{2\sqrt{x}}y\right)'_x = 2\frac{1}{2\frac{1}{2\sqrt{x}}}y = 2\frac{1}{2\frac{1}{2}} = \frac{2}{\frac{2}{2}} = \boxed{-\frac{1}{2}}$$

$$\frac{\partial^2 f}{\partial y^2} = (2\sqrt{x})'_y = \boxed{0}$$

$$\frac{\partial^2 f}{\partial x^2 \partial y} = \left(2\frac{1}{2\frac{1}{2\sqrt{x}}}y\right)'_y = 2/\frac{2}{2 \cdot \frac{1}{2}} = \frac{2}{\frac{2}{2}} = \frac{2}{2} \cdot \frac{1}{2} = \boxed{\frac{1}{2}}$$

$$\frac{\partial^3 f}{\partial x^3} = \left(2\frac{1}{2\frac{1}{2\sqrt{x}}}y\right)'_x = 2\frac{1}{2\frac{1}{\frac{1}{2\sqrt{x}}}}y =$$

$$= 2\frac{1}{2\frac{1}{2\sqrt{1}}} = \boxed{2}$$

$$\frac{\partial^3 f}{\partial y^3} = \left(2\frac{1}{2\frac{1}{\sqrt{x}}}y\right)'_y = 2\frac{1}{2\frac{1}{\sqrt{x}}} = \frac{2}{\frac{2}{1}} = \boxed{2}$$

$$\frac{\partial^3 f}{\partial x^2 \partial y} = \left(2\frac{1}{2\frac{1}{\sqrt{x}}}y\right)'_y = 2\frac{1}{2\frac{1}{\sqrt{x}}} = \frac{2}{\frac{2}{1}} = \boxed{2}$$

$$\frac{\partial^3 f}{\partial y^2 \partial x} = (2)' = \boxed{0}$$

c) $f(x,y) = 3x^5 - 2xy^2 + y^3$, $a = (2,1)$

$$\frac{\partial f}{\partial x} = (3x^5 - 2xy + y^3)'_x = 15x^4 - 2y = 15\cdot 2^4 - 2$$

$$= \boxed{238}$$

$$\frac{\partial f}{\partial y} = (3x^5 - 2xy^2 + y^3)'_y = -4xy + 3y^2 = -8+3 = \boxed{-5}$$

$$\frac{\partial^2 f}{\partial x^2} = (15x^4 - 2y)'_x = 60x^3 = 60 \cdot 2^3 = \boxed{480}$$

$$\frac{\partial^2 f}{\partial y^2} = (3y^2 - 4xy)'_y = 6y - 4x = 6 - 8 = \boxed{-2}$$

$$\frac{\partial^2 f}{\partial x \partial y} = (-4xy + 3y^2)'_x = -4y = \boxed{-4}$$

$$\frac{\partial^3 f}{\partial x^3} = (60x^3)'_x = 180x^2 = \boxed{720}$$

$$\frac{\partial^3 f}{\partial y^3} = (6y - 4x)'_y = \boxed{6}$$

$$\frac{\partial^3 f}{\partial x^2 \partial y} = (60x^3)'_y = \boxed{0}$$

$$\frac{\partial^3 f}{\partial y^2 \partial x} = (6y - 4x)'_x = \boxed{-4}$$

d) $f(x,y) = x^3 y + x y^3$, $a = (-1, 1)$

$$\frac{\partial f}{\partial x} = (x^3 y + x y^3)'_x = 3x^2 y + y^3 = 3 + 1 = \boxed{4}$$

$$\frac{\partial f}{\partial y} = (x^3 y + x y^3)'_y = x^3 + 3xy^2 = -1 - 3 = \boxed{-4}$$

$$\frac{\partial^2 f}{\partial x^2} = (3x^2y + y^3)'_x = 6xy = \boxed{-6}$$

$$\frac{\partial^2 f}{\partial y^2} = (x^3 + 3xy^2)'_y = 6xy = \boxed{-6}$$

$$\frac{\partial^2 f}{\partial x \partial y} = (3x^2y + y^3)'_y = 3x^2 + 3y^2 = 6 \quad ?$$

$$\frac{\partial^2 f}{\partial y \partial x} = (x^3 + 3xy^2)'_x = 3x^2 + 6xy = 3 - 6 = -3 \ ?$$

$$\frac{\partial^3 f}{\partial x^3} = (6xy)'_x = 6y = \boxed{6}$$

$$\frac{\partial^3 f}{\partial y^3} = (6xy)'_y = 6x = \boxed{-6}$$

$$\frac{\partial^3 f}{\partial x^2 \partial y} = (6xy)'_y = 6x = \boxed{-6}$$

$$\frac{\partial^3 f}{\partial y^2 \partial x} = (6xy)'_x = 6y = \boxed{6}$$

e) $f(x,y) = \frac{2x}{y} - \frac{y}{\sqrt{x}}, \quad a = (1,1)$

$$\frac{\partial f}{\partial x} = \left(\frac{2x}{y} - \frac{y}{\sqrt{x}}\right)'_x = \frac{y}{2x^{3/2}} + \frac{2}{y} = \frac{y^2 + 4x^{3/2}}{2x^{3/2}y} =$$

$$= \frac{1+4}{2} = \boxed{\frac{5}{2}}$$

$$\frac{\partial f}{\partial y} = \left(\frac{2x}{y} - \frac{y}{\sqrt{x}}\right)'_y = 2x\left(\frac{1}{y}\right)'_y - \frac{(y)'}{\sqrt{x}} = \frac{(y)'}{\sqrt{x}} +$$

$$+ \left(-\frac{1}{y^2}\right)2x = -\frac{2x}{y^2} - \frac{1}{\sqrt{x}} = -2 - 1 = \boxed{-3}$$

$$\frac{\partial^2 f}{\partial x^2} = \left(\frac{y^2 + 4x^{3/2}}{2x^{3/2}y}\right)'_x = \frac{\frac{4x^{3/2} + y^2}{x^{3/2}}}{2y} = \left(\left(4x^{3/2} + y^2\right)\left(\frac{1}{x^{3/2}}\right) +\right.$$

$$\left. + \frac{4x^{3/2} + y^2}{x^{3/2}}\right)\frac{1}{2y} = \frac{\frac{4x^{3/2} + y^2}{x^{3/2}} + \left(4x^{3/2} + y^2\right) - \frac{3}{2x^{5/2}}}{2y}$$

$$= \frac{\frac{-3(4x^{3/2} + y^2)}{2x^{5/2}} + \left(4\left(x^{3/2}\right) + y^2\right)\frac{1}{x^{3/2}}}{2y}$$

$$= \frac{\frac{-3(4x^{3/2} + y^2)}{2x^{5/2}} + \frac{y^2 + 4\frac{3\sqrt{x}}{2}}{x^{3/2}}}{2y} = \frac{\frac{-3(4x^{3/2} + y^2)}{2x^{5/2}} + \frac{6\sqrt{x} + y^2}{x^{3/2}}}{2y}$$

$$= \frac{\frac{6}{x} - \frac{3(4x^{3/2} + y^2)}{2x^{5/2}}}{2y} = \frac{6 - \frac{15}{2}}{2} = \frac{1}{2}\left(\overset{2}{\cancel{6}} - \frac{15}{2}\right) =$$

$$= \frac{1}{2}\left(\frac{12 - 15}{2}\right) = \frac{1}{2}\left(-\frac{3}{2}\right) = \boxed{-\frac{3}{4}}$$

$$\frac{\partial^2 f}{\partial y^2} = \left(-\frac{2x}{y^2} - \frac{1}{\sqrt{x}}\right)'_y = -2x \frac{1}{y^2} = -2x \cdot -\frac{2}{y^3} =$$

$$= \frac{4x}{y^3} = \frac{4}{1} = \boxed{4}$$

$$\frac{\partial^2 f}{\partial x \partial y} =$$

Probabilități - Temă:

1) a) $\Omega = ?$

$A_1 \cup A_2 \cup A_3 \cup \ldots \cup A_n = \Omega$

$\Omega = \{(M), (S)\}$ $\quad A = M, B = S$

b) $P(A) = \cancel{\overline{M} \wedge S}$

$P(B) = \overline{M} \cap S$

$P(C) = M$

$\begin{cases} M - \text{ev. apare } M & 1. \\ S - \text{ev. apare } S. & 2 \end{cases}$

$$\begin{array}{ll} & \begin{array}{ccc} I \cap & II \cap & III \end{array} \\ A - & \begin{cases} S & S & M \\ S & M & S \\ M & S & S \end{cases} \end{array}$$

$A = (S \cap S \cap M) \cup (S \cap M \cap S) \cup (M \cap S \cap S)$

$$B - \begin{cases} S & S & M \\ S & S & S \end{cases}$$

$B = (S \cap S \cap M) \cup (S \cap S \cap S)$

$$C - \begin{cases} M & M & M \\ M & S & M \\ S & M & M \\ S & S & M \end{cases}$$

$C = (M \cap M \cap M) \cup (M \cap S \cap M) \cup (S \cap M \cap M) \cup$
$\cup (S \cap S \cap M)$

c) $\overline{A} = 1 - P(A)$ $\quad P(A)_2 = \frac{2}{3} \Rightarrow 1 - \frac{2}{3} = \sim 0,4$

$A \cap B = P(A) \cdot P(B) = \frac{2}{3} \cdot \frac{2}{3} = \frac{4}{9} = 0,44$

$A \cup C = P(A) + P(C) = \frac{2}{3} + \frac{1}{3} = \frac{3}{3} = 1$

2) A_i; $i = \overline{1,3}$ - ev. "la intersecția i, pers. își continuă drumul"

a) are liber la toate intersecțiile

$A_1 = \frac{1}{3}$; $A_2 = \frac{2}{3}$; $A_3 = \frac{3}{3}$

b) oprește la toate intersecțiile

$A_1 = 0$; $A_2 = 0$; $A_3 = 0$

c) are liber la cel puțin o intersecție

$A_1 = A_2 = A_3 = \frac{1}{3}$

d) oprește la cel puțin o intersecție:

$A_1 = \frac{1}{3}$; $A_2 = \frac{2}{3}$; $A_3 = \frac{2}{3}$

3) a) 10 moduri

b) Presupunem că $P(A) = 3$ pers. și apoi 2 pers.

$\frac{3}{5} = \underline{0,6}$; $\frac{2}{5} = \underline{0,4}$

4) două zaruri

a) cazuri favorabile $= 2+6$; $6+2$; $4+4$; $3+5$; $5+3$

$A = \frac{5}{36} = 0,14$;

b) cazuri favorabile $= 1, 2, 3, 5$

$A = \frac{4}{36} = \frac{1}{6} = 0,16$

c) cel puţin 4

cazuri favorabile = 1+3 ; 3+1

cazuri posibile = 2+3, 3+2, 2+4; 4+2; 3+4; 4+3; 1+5; 5+1

36 5+2; 6+2; 5+3; 5+4; 5+6; 6+1, 6+2; 6+3

6+4; 6+5; 6+6; 3+3; 4+4; 5+5; 2+2;

3+1; 1+3

$A = \frac{33}{36} = \frac{11}{12} = 0,92$

6) caz. fav. = 1+5; 5+1; 2+4; 4+2; 3+3

caz. pos = 18

$A = \frac{5}{18}$

8) 5 pers. 7 etaje

caz. fav. = 2 pers - 1

2 pers - 2

1 pers - 3

$A = \frac{1}{7} = 0,14$

9) 7 cifre; $\emptyset$

a) caz. fav. $= 4^4$

caz. pos $= 7^7$ $\Rightarrow \frac{256}{823543} = 0,00031$

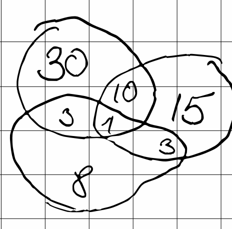
10) 30 - EM → 10 EM + DE

15 - DE 3 EM + FR

8 - FR 3 DE + FR

53 1 EM + DE + FR

Care este numărul de studenţi?



17+16+1+1 =

35+3 = $\boxed{38}$