мелі рішечі (1.4.)

(N)

Диференцірање сложених функција

(1.) $g(x,y)=f(\overbrace{2x^3+3y^2}^{u})$

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

$$g_x=\frac{\partial g}{\partial x}=\frac{\partial f}{\partial u}\cdot\frac{\partial u}{\partial x}=f_u\cdot u_x$$

$$g_y=\frac{\partial g}{\partial y}=\frac{\partial f}{\partial u}\cdot\frac{\partial u}{\partial y}=f_u\cdot u_y$$

$$u_x=6x^2$$

$$u_y=6y$$

$$\left.\begin{array}{l} g_x=f_u\cdot 6x^2 \\ g_y=f_u\cdot 6y\end{array}\right\}\Rightarrow y\cdot 6x^2 f_u=6y\cdot x^2 f_u$$

(2.)

$$z=f(u,v)$$

$$u=x+y \qquad u_x=1 \qquad u_y=1$$

$$v=x-y \qquad v_x=1 \qquad v_y=-1$$

$$\frac{\partial^2 z}{\partial x\partial y}=\frac{\partial^2 z}{\partial u^2}-\frac{\partial^2 z}{\partial v^2}\Rightarrow z_{xy}=z_{uu}-z_{vv}$$

$$z_x=\frac{\partial f}{\partial u}\cdot\frac{\partial u}{\partial x}+\frac{\partial f}{\partial v}\cdot\frac{\partial v}{\partial x}=f_u u_x+f_v v_x=f_u+f_v$$

$$z_y=f_u\cdot u_y+f_v\cdot v_y=f_u-f_v$$

$$z_{xy}=(z_x)'_y=\cancel{f_{uu}\cdot u_y+f_{vv}\cdot u_y-f_{uu}-f_{vv}}$$

$$=(f_u+f_v)'_y=(f_u)'_y+(f_v)'_y$$

$$(f_u)'_y=\frac{\partial^2 f}{\partial u^2}\cdot\frac{\partial u}{\partial y}+\frac{\partial^2 f}{\partial u\partial v}\cdot\frac{\partial v}{\partial y}=f_{uu}u_y+f_{uv}\cdot v_y=f_{uu}-f_{uv}$$

$$(f_v)'_y=\frac{\partial^2 f}{\partial v^2}\cdot\frac{\partial v}{\partial y}+\frac{\partial^2 f}{\partial v\partial u}\cdot\frac{\partial u}{\partial y}=f_{vv}v_y+f_{vu}\cdot u_y=f_{vu}-f_{vv}$$

$$z_{xy}=f_{uu}-\cancel{f_{uv}}+\cancel{f_{vu}}-f_{vv}=f_{uu}-f_{vv}$$

1

3) $z = z(x, y)$ Nuwicut [illegible] CA1 HEЧY!

$F(\underbrace{x+z}_{u}, \underbrace{y+z}_{v}) = 0$ GAO!

$\underline{z_{xx} = ?}$

$$\left.\begin{aligned} u &= x+z \\ v &= y+z \end{aligned}\right\} \quad z = z(x,y)$$

$\Rightarrow u_x = 1 + z_x$

$\underline{v_x = z_x}$

$F_x = F_u u_x + F_v v_x = 0 \longrightarrow$ F je bilo $= 0$, uslov je [illegible]

$F_u \cdot (1+z_x) + F_v \cdot z_x = F_u + F_u z_x + F_v z_x = F_u + z_x(F_u + F_v) = 0$

$$\Rightarrow \boxed{z_x = -\frac{F_u}{F_u + F_v}}$$

$F_{xx} = \left(F_u(1+z_x) + F_v z_x\right)'_x = 0$

$\Rightarrow (F_u)'_x(1+z_x) + F_u(1+z_x)'_x + (F_v)'_x z_x + F_v \cdot (z_x)'_x = 0$

$\Rightarrow (F_{uu} \cdot u_x + F_{uv} \cdot v_x)(1+z_x) + F_u \cdot z_{xx} + (F_{vv} v_x + F_{vu} u_x) z_x + F_v \cdot z_{xx} = 0$

$F_u \cdot z_{xx} + F_v \cdot z_{xx} = -(F_{uu} u_x + F_{uv} v_x)(1+z_x) - (F_{vv} v_x + F_{vu} u_x) z_x$

$z_{xx}(F_u + F_v) = -F_{uu} u_x - F_{uv} v_x - z_x(F_{uu} u_x + F_{uv} v_x) - z_x(F_{vv} v_x + F_{vu} u_x)$

$$z_{xx} = \frac{-F_{uu} u_x - F_{uv} v_x - z_x\left(F_{uu} u_x + F_{uv}(v_x + u_x) + F_{vv} v_x\right)}{F_u + F_v}$$

$$z_{xx} = \frac{-F_{uu} u_x - F_{uv} v_x + \frac{F_u}{F_u + F_v}\left(F_{uu} u_x + F_{uv}(u_x + v_x) + F_{vv} v_x\right)}{F_u + F_v}$$

$$z_{xx} = \frac{(-F_{uu} u_x - F_{vv} v_x)(F_u + F_v) + F_u\left(F_{uu} u_x + F_{uv}(u_x + v_x) + F_{vv} v_x\right)}{(F_u + F_v)^2}$$

$$= \frac{F_u\left(\cancel{-F_{uu} u_x} - \cancel{F_{vv} v_x} + \cancel{F_{uu} u_x} + F_{uv}(u_x + v_x) + \cancel{F_{vv} v_x}\right) - F_v \cdot F_{uu} u_x - F_v \cdot F_{vv} v_x}{(F_u + F_v)^2}$$

$$= \frac{F_u \cdot F_{uv}(u_x + v_x) - F_v F_{uu} u_x - F_v F_{vv} v_x}{(F_u + F_v)^2}$$

$$= \frac{F_u \cdot F_{uv}(1 + z_x + z_x) - F_v F_{uu}(1 + z_x) - F_v F_{vv} z_x}{(F_u + F_v)^2} =$$

$$z_{xx} = \frac{F_u \cdot F_{uv} + 2F_uF_{uv}z_x - F_vF_{uu} - F_vF_{uu}z_x - F_vF_{vv}z_x}{(F_u+F_v)^2} =$$

$$= \frac{F_u \cdot F_{uv} - F_vF_{uu} + z_x(2F_uF_{uv} - F_vF_{uu} - F_vF_{vv})}{(F_u+F_v)^2} =$$

$$= \frac{F_u F_{uv} - F_vF_{uu} - \frac{F_u}{F_u+F_v}(2F_uF_{uv} - F_vF_{uu} - F_vF_{vv})}{(F_u+F_v)^2} =$$

$$= \frac{(F_u+F_v)(-F_uF_{uv} - F_vF_{uu}) - F_u(2F_uF_{uv} - F_vF_{uu} - F_vF_{vv})}{(F_u+F_v)^3} =$$

$$= \frac{-F_u^2F_{uv} - F_u \cdot F_vF_{uu} - F_uF_vF_{uv} - F_v^2F_{uu} - 2F_u^2 \cdot F_{uv} + F_uF_vF_{uu} + F_uF_vF_{vv}}{(F_u+F_v)^3} =$$

$$= \frac{-3F_u^2F_{uv} + F_uF_v(F_{vv} - F_{uv}) - F_v^2F_{uu}}{(F_u+F_v)^3}$$

$z = xz^2 + ye^z + 2$ $\qquad z_x = ?$

$z_x = z^2 + x \cdot 2z \cdot z_x + y \cdot e^z \cdot z_x$

$z^2 + 2zx\,z_x + ye^z z_x - z_x = 0$

$-z_x(ye^z - 2x - 1) = z^2$

$$\boxed{z_x = \frac{z^2}{2x - ye^z + 1}}$$

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(3) $z = z(x,y)$

$F(x+z, y+z) = 0$

$z_{xx} = ?$

$u = x+z \qquad u_x = 1 + z_x$

$v = y+z \qquad v_x = z_x$

$F_x = 0$

$F_x = F_u u_x + F_v v_x = F_u(1+z_x) + F_v(z_x) = F_u + F_u \cdot z_x + F_v z_x =$

$= F_u + z_x(F_u + F_v) = 0$

$z_x(F_u + F_v) = -F_u$

$$\boxed{z_x = -\frac{F_u}{F_u+F_v}} \qquad u_x = 1 + z_x = \frac{\cancel{F_u} + F_v - \cancel{F_u}}{F_u+F_v} = \frac{F_v}{F_u+F_v}$$

$$\boxed{u_x = \frac{F_v}{F_u+F_v}} \qquad \boxed{v_x = -\frac{F_u}{F_u+F_v}}$$

$F_{xx} = 0$

$$F_{xx} = (F_x)'_x = (F_u u_x + F_v v_x)'_x = (F_u(1+z_x) + F_v z_x)'_x =$$

$$= (F_u)'_x (1+z_x) + F_u (1+z_x)'_x + (F_v)'_x z_x + F_v z_{xx} =$$

$$= (F_{uu} u_x + F_{uv} v_x)(1+z_x) + F_u z_{xx} + (F_{vv} v_x + F_{vu} u_x) z_x + F_v z_{xx} =$$

$$= z_{xx}(F_u + F_v) + F_{uu} u_x + F_{uv} v_x + z_x (F_{uu} u_x + F_{uv}(v_x + u_x) + F_{vv} v_x) =$$

$$=$$

$$z_{xx}(F_u + F_v) = -F_{uu} \cdot \frac{F_v}{F_u+F_v} + F_{uv} \cdot \frac{F_u}{F_u+F_v} + \frac{F_u}{F_u+F_v}\left(F_{uu} \cdot \frac{F_v}{F_u+F_v} + F_{uv} \cdot \frac{F_v - F_u}{F_v + F_u} - F_{vv} \cdot \frac{F_u}{F_u+F_v}\right)$$

$$z_{xx}(F_u + F_v) = \frac{F_{uv} \cdot F_u - F_{uu} F_v}{F_u + F_v} + \frac{F_u (F_{uu} F_v + F_{uv}(F_v - F_u) - F_{vv} \cdot F_u)}{(F_u+F_v)^2} =$$

$$= \frac{(F_u+F_v)(F_{uv}F_u - F_{uu}F_v) + F_u(F_{uu}F_v + F_{uv}(F_v - F_u) - F_{vv}F_u)}{(F_u+F_v)^2}$$

$$= \frac{F_u(F_{uv}F_u - \cancel{F_{uu}F_v} + \cancel{F_{uu}F_v} + F_{uv}(F_v - F_u) - F_{vv}F_u) - F_v^2 F_{uu}}{(F_u+F_v)^2}$$

$$= \frac{F_u^2 F_{uv} + F_{uv}F_v - F_{uv}F_u - F_v^2 F_{uu}}{(F_u+F_v)^2}$$

БАБО!

$$(F_{uu} u_x + F_{uv} v_x)(1+z_x) + F_u z_{xx} + (F_{uv} u_x + F_{vv} v_x) z_x + F_v z_{xx} = 0$$

$$(F_{uu}(1+z_x) + F_{uv} z_x)(1+z_x) + (F_{uv}(1+z_x) + F_{vv} z_x) z_x + z_{xx}(F_u + F_v) = 0$$

$$(F_{uu} + F_{uu} z_x + F_{uv} z_x)(1+z_x) + (F_{uv} + F_{uv} z_x + F_{vv} z_x) z_x + z_{xx}(F_u + F_v) = 0$$

$$F_{uu} + F_{uu} z_x + F_{uv} z_x + F_{uu} z_x + F_{uu} z_x^2 + F_{uv} z_x^2 + F_{uv} z_x + F_{uv} z_x^2 + F_{vv} z_x^2 + z_{xx}(F_u + F_v) = 0$$

$$F_{uu} + 2F_{uu} z_x + 2F_{uv} z_x + F_{uu} z_x^2 + 2F_{uv} z_x^2 + F_{vv} z_x^2 + z_{xx}(F_u + F_v) = 0$$

$$F_{uu} - \frac{2F_{uu}F_u}{F_u+F_v} - \frac{2F_{uv}F_u}{F_u+F_v} + F_{uu} \cdot \frac{F_u^2}{(F_u+F_v)^2} + 2F_{uv} \cdot \frac{F_u^2}{(F_u+F_v)^2} + F_{vv} \cdot \frac{F_u^2}{(F_u+F_v)^2} + z_{xx}(F_u+F_v) = 0$$

$$\frac{F_{uu}(F_u+F_v)^2 - 2F_{uu}F_u(F_u+F_v) - 2F_{uv}F_u(F_u+F_v) + F_{uu}F_u^2 + 2F_{uv}F_u^2 + F_{vv}F_u^2}{(F_u+F_v)^2} + z_{xx}(F_u+F_v) = 0$$

$$\frac{\cancel{F_{uu}F_v^2} + 2F_{uv}F_vF_u - 2F_{uu}F_u^2 - 2F_{uu}F_uF_v + 2F_{uv}F_u^2 - 2F_{uv}F_uF_v + \cancel{F_{uu}F_u^2} + \cancel{2F_{uv}F_u^2} + F_{vv}F_u^2}{(F_u+F_v)^2} = -z_{xx}(F_u+F_v)$$

$$\frac{-2F_{uv}F_uF_v + F_{vv}F_u^2}{(F_u+F_v)^2} = -z_{xx}(F_u+F_v)$$

(3.) $z_x = -\dfrac{F_u}{F_u+F_v}$

$u_x = 1+z_x$

$v_x = z_x$

$F_x = F_u(1+z_x) + F_v\cdot z_x$

$F_{xx} = (F_{uu}u_x + F_{uv}v_x)(1+z_x) + F_u z_{xx} + (F_{vv}v_x + F_{vu}u_x)z_x + F_v z_{xx} = 0$

$\Rightarrow \quad (F_{uu}(1+z_x) + F_{uv}\cdot z_x)(1+z_x) + F_u z_{xx} + (F_{vv}z_x + F_{vu}(1+z_x))z_x + F_v z_{xx} =$

$= (F_{uu} + F_{uu}z_x + F_{uv}z_x)(1+z_x) + (F_{vv}z_x + F_{vu} + F_{vu}z_x)z_x + z_{xx}(F_u+F_v) =$

$= F_{uu} + F_{uu}z_x + F_{uv}z_x + F_{uu}z_x + F_{uu}z_x^2 + F_{uv}z_x^2 + F_{vv}z_x^2 + F_{vu}z_x + F_{uv}z_x^2 + z_{xx}(F_u+F_v) =$

$= F_{uu} + 2F_{uu}z_x + 2F_{uv}z_x + F_{uu}z_x^2 + 2F_{uv}z_x^2 + F_{vv}z_x^2 + z_{xx}(F_u+F_v) =$

$= F_{uu} - \dfrac{2F_{uu}F_u}{F_u+F_v} - \dfrac{2F_{uv}F_u}{F_u+F_v} + \dfrac{F_{uu}F_u^2}{(F_u+F_v)^2} + \dfrac{2F_{uv}F_u^2}{(F_u+F_v)^2} + \dfrac{F_{vv}F_u^2}{(F_u+F_v)^2} + z_{xx}(F_u+F_v) =$

$= \dfrac{F_{uu}(F_u+F_v)^2 - 2F_{uu}F_u(F_u+F_v) - 2F_{uv}F_u(F_u+F_v) + F_{uu}F_u^2 + 2F_{uv}F_u^2 + F_{vv}F_u^2}{(F_u+F_v)^2} + z_{xx}(F_u+F_v) =$

$= \dfrac{F_{uu}F_u^2 + 2F_{uu}F_uF_v + F_{uu}F_v^2 - 2F_{uu}F_u^2 - 2F_{uu}F_uF_v - 2F_{uv}F_u^2 - 2F_{uv}F_uF_v + F_{uu}F_u^2 + 2F_{uv}F_u^2 + F_{vv}F_u^2}{(F_u+F_v)^2}$

$= \dfrac{F_{uu}F_v^2 - 2F_{uv}F_uF_v + F_{vv}F_u^2}{(F_u+F_v)^2} + z_{xx}(F_u+F_v) = )$

$\Rightarrow \quad z_{xx}(F_u+F_v) = \dfrac{-F_{uu}F_v^2 + 2F_{uv}F_uF_v - F_{vv}F_u^2}{(F_u+F_v)^2}$

$$\boxed{z_{xx} = \dfrac{-F_{uu}F_v^2 + 2F_{uv}F_uF_v - F_{vv}F_u^2}{(F_u+F_v)^3}}$$

(4) $z = \sqrt{\dfrac{x}{y}}\, f(xy) + g\left(\dfrac{x}{y}\right) \qquad x^2 z_{xx} - y^2 z_{yy} - 2y z_y = ?$

$u = \dfrac{x}{y}, \quad v = xy \longrightarrow z = \sqrt{u}\, f(v) + g(u)$

$u_x = \dfrac{1}{y} \qquad v_x = y$

$u_y = -\dfrac{x}{y^2} \qquad v_y = x$

$$z_x = z_u u_x + z_m m_x = z_u \cdot \frac{1}{y} + z_m \cdot y$$

$$z_{xx} = (z_{uu} u_x + z_{um} m_x)\frac{1}{y} + (z_{mm} m_x + z_{mu} u_x)\, y =$$

$$= \left(z_{uu} \frac{1}{y} + z_{um} \cdot y\right)\frac{1}{y} + \left(z_{mm}\, y + z_{mu} \cdot \frac{1}{y}\right) y =$$

$$= z_{uu} \cdot \frac{1}{y^2} + z_{um} + z_{mm}\, y^2 + z_{mu} =$$

$$= \boxed{z_{uu} \frac{1}{y^2} + 2 z_{um} + z_{mm}\, y^2}$$

$$z_y = z_u u_y + z_m m_y = \boxed{z_u \cdot \left(-\frac{x}{y^2}\right) + z_m \cdot x}$$

$$z_{yy} = (z_{uu} u_y + z_{um} m_y)\left(-\frac{x}{y^2}\right) + z_u \cdot \frac{2x}{y^3} + (z_{mm} m_y + z_{mu} u_y)\, x =$$

$$= \left(z_{uu} \cdot \left(-\frac{x}{y^2}\right) + z_{um} \cdot x\right)\left(-\frac{x}{y^2}\right) + z_u \frac{2x}{y^3} + \left(z_{mm} \cdot x + z_{mu} \cdot \left(-\frac{x}{y^2}\right)\right) x =$$

$$= z_{uu} \cdot \frac{x^2}{y^4} - z_{um} \frac{x^2}{y^2} + z_u \frac{2x}{y^3} + z_{mm} x^2 - z_{mu} \frac{x^2}{y^2} =$$

$$= \boxed{z_{uu} \cdot \frac{x^2}{y^4} - 2 z_{um} \frac{x^2}{y^2} + z_u \frac{2x}{y^3} + z_{mm}\, x^2}$$

$$x^2 \cdot z_{xx} - y^2 z_{yy} - 2y z_y = A$$

$$A = x^2\left(z_{uu} \frac{1}{y^2} + 2 z_{um} + z_{mm} \cdot y^2\right) - y^2\left(z_{uu} \frac{x^2}{y^4} - 2 z_{um} \frac{x^2}{y^2} + z_u \frac{2x}{y^3} + z_{mm} x^2\right) -$$

$$- 2y\left(-z_u \cdot \frac{x}{y^2} + z_m \cdot x\right)$$

$$A = z_{uu} \frac{x^2}{y^2} + z_{um} \cdot 2x^2 + \cancel{z_{mm} \cdot x^2 y^2} - z_{uu} \cdot \frac{x^2}{y^2} + z_{um} 2x^2 - \cancel{z_u \cdot \frac{2x}{y}} - \cancel{z_{mm} x^2 y^2} + \cancel{z_u \frac{2x}{y}} - z_m \cdot 2xy$$

$$\boxed{A = z_{um} \cdot 4x^2 - z_m \cdot 2xy}$$

(1) $x \cdot z_x + y z_y = ?$

$$z(x,y) = z$$

$$F\left(\frac{x}{z}, \frac{y}{z}\right) = 0$$

$$u = \frac{x}{z} \qquad m = \frac{y}{z}$$

$$u_x = \frac{z - x \cdot z_x}{z^2} \qquad m_x = -\frac{y}{z^2} \cdot z_x$$

$$u_y = -\frac{x}{z^2} z_y \qquad m_y = \frac{z - y\, z_y}{z^2}$$

$$F_x = F_u u_x + F_m m_x = F_u \cdot \frac{z - x z_x}{z^2} + F_m \cdot \left(-\frac{y\, z_x}{z^2}\right) =$$

$$= \frac{F_u \cdot z - F_u \cdot x z_x - F_m y\, z_x}{z^2} = 0$$

$$F_u z = z_x (F_u x + F_m y)$$

$$\boxed{z_x = \frac{F_u \cdot z}{F_u \cdot x + F_m \cdot y}}$$

$$F_y = F_{UU} U_y + F_{MM} M_y = F_{UU} \cdot \left(-\frac{x \cdot z_y}{z^2}\right) + F_{MM} \cdot \frac{z - y \cdot z_y}{z^2} = 0$$

$$\Rightarrow -F_{UU} \cdot x \cdot z_y + F_{MM} \cdot z - F_{MM} \cdot y \cdot z_y = 0$$

$$F_{MM} z = z_y (F_{UU} \cdot x + F_{MM} y)$$

$$\boxed{z_y = \frac{F_{MM} z}{F_{UU} \cdot x + F_{MM} y}}$$

$$A = x \cdot z_x + y \cdot z_y$$

$$A = x \cdot \frac{F_U \cdot z}{x \cdot F_U + y \cdot F_M} + y \cdot \frac{F_M \cdot z}{F_U \cdot x + F_M \cdot y}$$

$$A = \frac{F_U \cdot x \cdot z + F_M \cdot y \cdot z}{x F_U + y F_M} = \frac{z\,\cancel{(F_U \cdot x + F_M \cdot y)}}{\cancel{F_U \cdot x + F_M \cdot y}} = z$$

$$\boxed{A = z}$$

(2) $z = z(x, y)$

$$F\left(\frac{1}{x+y} + \frac{1}{z}, \frac{1}{x-y} + \frac{1}{z}\right) = 0$$

$$(x^2 + y^2) z_x + 2xy z_y + z^2 = ?$$

$$U = \frac{1}{x+y} + \frac{1}{z} \qquad M = \frac{1}{x-y} + \frac{1}{z}$$

$$U_x = -\frac{1}{(x+y)^2} - \frac{z_x}{z^2} \qquad M_x = -\frac{1}{(x-y)^2} - \frac{z_x}{z^2}$$

$$U_y = -\frac{1}{(x+y)^2} - \frac{z_y}{z^2} \qquad M_y = \frac{1}{(x-y)^2} - \frac{z_y}{z^2}$$

$$F_x = F_U U_x + F_M M_x = F_U \cdot \left(-\frac{1}{(x+y)^2} - \frac{z_x}{z^2}\right) + F_M \cdot \left(-\frac{1}{(x-y)^2} - \frac{z_x}{z^2}\right) = 0$$

(4)

$$-\frac{F_U}{(x+y)^2} - \frac{F_U \cdot z_x}{z^2} - \frac{F_M}{(x-y)^2} - \frac{F_M \cdot z_x}{z^2} = 0$$

$$U = \frac{x}{y} \qquad \frac{F_U z_x + F_M z_x}{z^2} = -\frac{F_U}{(x+y)^2} - \frac{F_M}{(x-y)^2}$$

$$U_x = \frac{1}{y} \qquad \frac{z_x (F_U + F_M)}{z^2} = -\left(\frac{F_U (x-y)^2 + F_M (x+y)^2}{(x+y)^2 (x-y)^2}\right)$$

$$U_y = -\frac{x}{y^2} \qquad \boxed{z_x = -\frac{z^2 \left(F_U (x-y)^2 + F_M (x+y)^2\right)}{(F_U + F_M)(x+y)^2 (x-y)^2}}$$

$$F_y = F_U U_y + F_M M_y = F_U \cdot \left(-\frac{1}{(x+y)^2} - \frac{z_y}{z^2}\right) + F_M\left(\frac{1}{(x-y)^2} - \frac{z_y}{z^2}\right) = 0$$

$$-\frac{F_U}{(x+y)^2} - \frac{F_U \cdot z_y}{z^2} + \frac{F_M}{(x-y)^2} - \frac{F_M \cdot z_y}{z^2} = 0$$

$$\frac{F_U z_y + F_M z_y}{z^2} = \frac{F_M}{(x-y)^2} - \frac{F_U}{(x+y)^2}$$

$$\frac{z_y(F_U + F_M)}{z^2} = \frac{F_M(x+y)^2 - F_U(x-y)^2}{(x+y)^2(x-y)^2}$$

$$\boxed{z_y = \frac{z^2\left(F_M(x+y)^2 - F_U(x-y)^2\right)}{(F_U+F_M)(x+y)^2(x-y)^2}}$$

$$A = (x^2+y^2) z_x + 2xy\, z_y + z^2$$

$$A = (x^2+y^2)\left(-\frac{z^2\left(F_U(x-y)^2 + F_M(x+y)^2\right)}{(F_U+F_M)(x^2-y^2)^2}\right) + 2xy \cdot \frac{z^2\left(F_M(x+y)^2 - F_U(x-y)^2\right)}{(F_U+F_M)(x^2-y^2)^2} + z^2$$

$$A = \frac{-z^2(x^2+y^2)\left(F_U(x-y)^2 + F_M(x+y)^2\right) + z^2 \cdot 2xy\left(F_M(x+y)^2 - F_U(x-y)^2\right) + z^2\left((F_U+F_M)(x^2-y^2)^2\right)}{(F_U+F_M)(x^2-y^2)^2}$$

$$A = \frac{-F_U(x-y)^2 \cdot z^2(x^2+y^2) - F_M(x+y)^2 \cdot z^2(x^2+y^2) + F_M(x+y)^2 \cdot z^2 \cdot 2xy - F_U(x-y)^2 \cdot z^2 \cdot 2xy + z^2\left((F_U+F_M)(x^2-y^2)^2\right)}{(F_U+F_M)(x^2-y^2)^2}$$

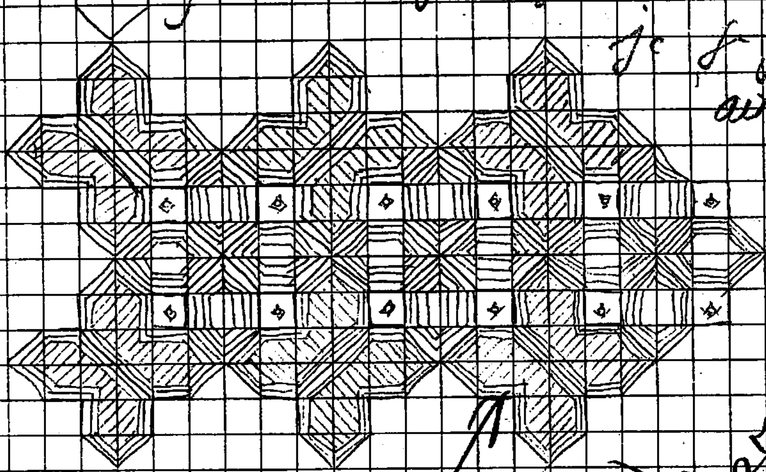
$$A = \frac{-F_U(x-y)^2\left(z^2(x^2+y^2) + z^2 \cdot 2xy\right) + F_M(x+y)^2\left(-z^2(x^2+y^2) + z^2 \cdot 2xy\right) + z^2\left((F_U+F_M)(x^2-y^2)^2\right)}{(F_U+F_M)(x^2-y^2)^2}$$

$$A = \frac{-F_U(x-y)^2 \cdot z^2(x+y)^2 - F_M(x+y)^2 \cdot z^2(x-y)^2 + z^2\left((F_U+F_M)(x^2-y^2)^2\right)}{(F_U+F_M)(x^2-y^2)^2}$$

$$A = \frac{-z^2\left(F_U(x^2-y^2)^2 + F_M(x^2-y^2)^2\right) + z^2\left((F_U+F_M)(x^2-y^2)^2\right)}{(F_U+F_M)(x^2-y^2)^2}$$

$$A = \frac{\cancel{(F_U+F_M)(x^2-y^2)^2}\left(-z^2+z^2\right)}{\cancel{(F_U+F_M)(x^2-y^2)^2}} = 0$$

~~[illegible]~~ И каже се да [illegible] код свакој [illegible] и је [illegible]?



Сад нећу тражити [illegible]

$$\frac{1}{y^2} = \frac{-1\cdot 2y}{y^4} = -\frac{2}{y^3}$$

$$-\frac{2}{y^3}\cdot 1$$

$$\frac{e^x}{(x+2)^2} = -e^x\left(\frac{1}{(x+2)^2}\right)$$

$$= -e^x\left(-\frac{2}{(x+2)^3}\right)\cdot 2(x+2)\cdot 1$$

По [illegible] нећу тражити

ДАКА!

А до малопре си хтео да идеш у мензу!

Крме! Ко је овде [illegible]?

ДА ХТЕО САМ ПОСО ИСПРАВ АЛИ НЕ [illegible]

А како си [illegible] пријатељи!

Ја идем се једам!

НЕ ЗАШТО СЕ СТАЛНО СВАЂАТЕ ОКО ХРАНЕ?

ЈА САМ САМО СА ТЕЛОМ ПРЕДАТЕЉ