$$z''_{xy} = \left(\frac{y^3}{(x^2+y^2)^{3/2}}\right)'_y = \frac{3y^2(x^2+y^2)^{3/2} - y^3 \cdot \frac{3}{2}\sqrt{x^2+y^2}\cdot 2y}{(x^2+y^2)^3} =$$

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

7.60

$z = y^x$.

Решение

$y' = y(\ln y)'$, $y > 0$

$\ln z = \ln y^x = x\ln y$

$z'_x = z(\ln z)'_x = y^x(x\ln y)'_x = y^x \ln y$

$z'_y = z(\ln z)'_y = y^x(x\ln y)'_y = y^x \frac{x}{y} = xy^{x-1}$,

$z''_{xx} = (y^x \ln y)'_x = \ln y \cdot y^x \ln y = \ln^2 y \cdot y^x$,

$z''_{yy} = (xy^{x-1})'_y = x(x-1)y^{x-2}$

$z''_{xy} = (y^x \ln y)'_y = y^x \ln y \ln y + y^x \frac{1}{y} = \ln^2 y\, y^x + y^{x-1} =$

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

$z''_{yx} = (xy^{x-1})'_y = x(x-1)y^{x-2}$