LATEX PRACTICE

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Math AoPS

5.37)

Compute $\frac{x}{y}$

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

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

$y + \frac{1}{-\frac{1}{y}+4} = \frac{1}{4}$

$\frac{-\frac{1}{y}+4}{-\frac{1}{y}+4} \times y + \frac{1}{-\frac{1}{y}+4} = \frac{1}{4}$

$\frac{-1+4y+1}{-\frac{1}{y}+4} = \frac{1}{4}$

$\frac{4y}{-\frac{1}{y}+4} = \frac{1}{4}$

$\frac{16y}{-\frac{1}{y}+4} = 1$

$16y = -\frac{1}{y} + 4$

$16y + \frac{1}{y} = 4$

$\frac{16y^2}{y} + \frac{1}{y} = 4$

$\frac{16y^2+1}{y} = 4$

$16y^2 + 1 = 4y$

$16y^2 - 4y + 1 = 0$

$\frac{-b\pm\sqrt{b^2-4ac}}{2a} = \frac{4\pm\sqrt{(-4)^2-4\times16\times1}}{2\times16}$

$\frac{4\pm\sqrt{16-64}}{32} = \frac{4\pm\sqrt{-48}}{32}$

No real solutions.