School of Mathematics and Statistics

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Course No. and Section: _____ Instructor Name: _____

Date: _____ Student Name: _____ Student No.: _____

MATH 1007C

Test 1 Solutions

1) a) $\dfrac{\frac{4}{a}+\frac{5}{b}}{4b+5a} = \dfrac{\frac{4b+5a}{ab}}{4b+5a} = \dfrac{4b+5a}{ab(4b+5a)} = \dfrac{1}{ab}$.

b) $\left(\dfrac{5x^3y^{-4}}{xy^{-1/2}}\right)^2 = \dfrac{5^2x^{3\cdot2}y^{-4\cdot2}}{x^2y^{-1/2\cdot2}} = \dfrac{25x^6y^{-8}}{x^2y^{-1}}$

$= 25x^6y^{-8}x^{-2}y^1 = 25x^{6-2}y^{-8+1} = 25x^4y^{-7}$.

c) $(\sqrt{5})^{1/2}(\sqrt{35})^{1/2} = (5^{1/2})^{1/2}(35^{1/2})^{1/2} = 5^{1/2\cdot1/2}35^{1/2\cdot1/2}$

$= 5^{1/4}(5\cdot7)^{1/4} = 5^{1/4}5^{1/4}7^{1/4} = 5^{1/4+1/4}7^{1/4} = 5^{1/2}7^{1/4} = \sqrt{5}\sqrt[4]{7}$.

d) $e^{\ln 3x^2 - 2\ln x} = e^{\ln 3x^2 - \ln x^2} = e^{\ln\left(\frac{3x^2}{x^2}\right)} = e^{\ln 3} = 3$.

The first two equalities are justified by the logarithm laws. The last equality follows from the fact that for any $c>0$, $e^{\ln c} = c$.