MA 158

14 October 2016

Instructions: Show all work, with clear logical steps. No work or hard-to-follow work will lose points.

Problem 1. (2 points) Simplify the expression

 $e^{3+\ln 5}$.

Solution. $e^{3+\ln 5} = e^3 e^{\ln 5} = 5e^3$.

Problem 2. (2 points) Solve the following expression

$$\ln(x^2 - 15) = \ln(4x - 3).$$

Solution. Each side of the equal sign is equal if and only if the insides of the \ln 's are equal. So we set

$$x^{2} - 15 = 4x - 3$$

$$\Leftrightarrow x^{2} - 4x - 12 = 0$$

$$\Leftrightarrow (x + 2)(x - 6) = 0$$

$$\Rightarrow x = -2, 6.$$

Of course, we need to check that x = -2 and x = 6 are actually solutions. If we plug in -2 for x into $\ln(4x - 3)$, we get $\ln(-8 - 3) = \ln(-11)$, which is undefined. Plugging in 6 on each side gives us a real answer, so the only solution is x = 6.

Quiz 8

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