

[5r] My dear Lady Lovelace

I should be as able as willing to see you in town on Friday, but have first heard that M^r Frennd is not so well as he has been, and am going to Highgate to day to see how he is. In consequence, having various matters to complete definitively by the 16th instant, I shall find it impossible to go to town again this week.

With regard to the second chapter, pray remember that you are not supposed to know, or to want to know, what differentiation is, but only that there is a process of that name, which is to be learnt by rule for the present, [5v] as an exercise in algebraical work. With regard to the logarithms, in the first place, Bourdon is too long. If you will look at the chapter in my algebra, you will find it shorter.

In the equation

$$a^b = c$$

b is called the logarithm of c to the base a . This is the meaning of the term. But for convenience the series $1 + 1 + \frac{1}{2} + \frac{1}{2 \times 3} + \frac{1}{2 \times 3 \times 4} + \&c$ ad inf or $2.7182818 \dots$ (called ε) is the base always used in theory; while when assistance in calculation is the object, 10 is always the base; thus if

$$\varepsilon^x = y \quad x \text{ is the logarithm of } y$$

[6r] Thus $a = \log b$ is by definition synonymous with $b = \varepsilon^a$ ε being $2.7182818 \dots$

I remain

Yours very truly

ADeMorgan

3 Grotes' Place, Blackheath
Wednesday M^g