[12r] My dear Lady Lovelace

You have got through the matter about which you write better than I should have expected.

I have finished what you sent as you will see

With regard to the curve, I drew it as containing every possible sort of singular point. Its equation would be enormously complex

There must be an infinite number of different equations which belong to a curve of a similar form, but the question 'given the more general [12v] form of a curve, required the equations which may belong to such form' is a very difficult one.

I will merely give you a glimpse

Required an equation to a curve such that it passes through the following points P Q R

[diagram in original] at P let $x = a$, $y = A$

Q $x = b$ $y = B$

R $x = c$ $y = C$

[the next formula and the following line of text stretch across 12v and 13r]

$$y = A\tfrac{(x-b)(x-c)}{(a-b)(a-c)} + B\tfrac{(x-c)(x-a)}{(b-c)(b-a)} + C\tfrac{(x-a)(x-b)}{(c-a)(c-b)} + \left\{\begin{array}{c}\text{any function of } x \text{ which}\\ \text{does not become infinite}\\ \text{when } x = a, \text{ or } b, \text{ or } c\end{array}\right\} \times (x-a)(x-b)(x-c)$$

Here is an infinite number of equations which you will find to satisfy the conditions

I have to thank you for very good partridges received from Ockham

With kind remembrances to Lord Lovelace

I am Yours very truly

ADeMorgan

I have heard of Lady Byron by M^{r} Phitton [?] who left her safe at Fountainebleu