[35r] My dear Lady Lovelace

We shall be happy to
see you on Monday Evening, and
Lord Lovelace too if he be not
afraid of the algebra
Your points in your letter are
are [should be 'I'] think, clear enough in
your own head. A little addition
however may be made as follows.

You are not [something crossed out] to think that
because x must be diminished
without limit to prove a conclusion
that conclusion is only true for
small values of x, or for $x = 0$.

For example suppose I know that

$$(a + x)(a - x) = P + Qx + Rx^2$$

but of P Q and R I only know that
they are independent of x. What
[35v] therefore they are for any
one value of x, they are for
any other. I find them thus
Since the preceding is by hypothesis
true for all values of x, and
since altering x does not alter
P Q or R, I take $x = 0$
to begin with

$$a^2 = P \text{ when } x = 0$$

but a and P are independent
of x, therefore what relation
exists when $x = 0$ exists always
or $a^2 = P$
Let $x = a$

$$0 = P + Qa + Ra^2$$

Let $x = -a$

$$0 = P - Qa + Ra^2$$

[something crossed out] subtract $2Qa = 0$ or $Q = 0$
Here are two values of x made use
[36r] of.

Add

$$2P + 2Ra^2 = 0$$

$$R = -\frac{P}{a^2} = -1$$

whence

$$(a+x)(a-x) = a^2 + 0.x - x^2$$
$$= a^2 - x^2$$

if it must be of the form

$$P + Qx + Rx^2$$

We are much obliged by your invitation to Ockham, but I am closely tied up by lectures & other things. Even at such times as Xtmas I am generally very busy

With kind remembrances to Lord Lovelace I am

Yours very truly

ADeMorgan