[29r] My dear Lady Lovelace

I have made some additional
notes on your papers.
[diagram in original] The meaning of $\frac{\theta}{\sin\theta}$ is as follows

$\theta : 1$ and $1 : \sin\theta$ compounded
give it in arithmetic

In fact $\frac{a}{b}$ in arithmetic is another way of writing
$a : b$.

In geometry $AB : AO$ is $\theta[:]1$

and $\quad AO$ or $OB : BM$ is $\sin\theta$

The compounded ratio is that of $AB : BM$
which approaches without limit to the
ratio of 1 to 1 as AB is diminished
Your notion of the ratio approximating to
unity is correct. The term 'ratio approximating
to a' is a mixture of the geometrical and
[29v] arithmetical mode of speaking, it
should be 'ratio approximating to

$a : 1$.

I think you have got over the diffi-
culty of that part of the subject

I was sorry to have been out
when Lord Lovelace called, and
could not get down to St James' Square
till you had gone. With best
remembrances   I am

Yours very truly
ADeMorgan