3D amplification factor - verifying separable generalization

Using the result from the 2D and 3D Douglas ADI,

For the error, we have

Therefore we have

Or

Let

And finding the least common denominator, we have

To shorten the notation, let's write this as

Looking at only the numerator, we have

I would like to write the numerator in the form

Expanding this out, we have

Or

As you can see, the original can therefore be written as