**EE307 assignment8 Homework**

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Question：

A small parabolic reflector of 1m diameter is operated at 3 GHz. The taper efficiency is 80 precent; the spill over efficiency is 85 percent. Assume no other losses. Find

a) the total efficiency of the antenna in dB,

b) the directivity in dB.

a)

Total efficiency can be calculated using the formula:

Because given:

Then we get:

To express this in dB, we can use the formula:

So:

b)

Directivity D can be calculated using the formula:

Given:

We need to calculate the wavelength first:

So:

Now, calculate the effective aperture :

Now, plug the values into the formula for directivity:

Then we get:

To express this in dB, we use the formula: