



$$\theta_{3dB} \approx \left( \frac{75 \lambda}{D} \right) \text{ deg} \rightarrow \textcircled{2}$$

$$G \approx \frac{33000}{(\theta_{3dB})_H (\theta_{3dB})_V} \rightarrow \textcircled{3}$$

$\downarrow$  Horizontal       $\downarrow$  Vertical

The earth subtends an angle of  $17^\circ$  when viewed from geostationary orbit.

what are the dimensions and gain of horn antenna that will provide global coverage at 4 GHz

Answer,

$$\frac{D}{\lambda} = \frac{75}{17^\circ} = 4.4$$

The continental United States (48 contiguous states) subtends an angle of approximately  $6^\circ \times 3^\circ$  when viewed from geostationary orbit. What dimension must a reflector antenna have to illuminate half this area with a circular beam  $3^\circ$  in diameter at 11 GHz?

Can a reflector be used to produce a  $6^\circ \times 3^\circ$  beam? What gain would the antenna have?