

$$\begin{array}{l}
\Gamma \\
V, E, F \\
\vec{E} \\
\vec{e} \\
(f_{\vec{e}}, e) \\
f_{\vec{e}} \\
\vec{e} \\
\vec{e} \\
\vec{e} \\
\vec{e} \\
\vec{e} \\
C_f \\
r_f \\
\vec{e} \\
p_{attn})[width = \\
8cm]circle_{p_{attn}}Circle_{pattern}intermsof radii_f \\
\vec{e} \times \\
:=_+^F = \\
\{(r_f)_{f \in F} | r_f \in_+ \\
\} \\
:=_{\vec{E}}^{\vec{E}} = \\
\{(\vec{e})_{\vec{e} \in \vec{E}} | \vec{e} \in \\
\} \\
\vec{c} \in \\
\times \\
\times \\
\Phi_f = \\
2 \sum_{\vec{e} \in f} \vec{e} \\
C_f \\
\theta_e = \\
\pi - \vec{e} \\
\vec{e} \\
l_{\vec{e}} = \\
2r_{f_{\vec{F}}} \sin \vec{e} \\
:=_{\vec{F}}^{\vec{F}} = \\
\{(\Phi_f)_{f \in F} | \Phi_f \in \\
\} \\
:=_E^E = \\
\{(\theta_e)_{e \in E} | \theta_e \in \\
\} \\
:=_{\vec{E}}^{\vec{E}} = \\
\{(l_{\vec{e}})_{\vec{e} \in E} | l_{\vec{e}} \in \\
\} \\
\Gamma \\
ex- \\
tended \\
cyr- \\
cle \\
pat- \\
tern \\
\Gamma \\
\vec{c} = \\
((r_f), (\vec{e})) \in \\
\times \\
l_{\vec{e}} = \\
l_e \in \\
\vec{e} \in \\
F \\
\vec{e} = \\
l_e \} [r, " \subset \\
"] \times \\
[r, " \Theta"] [d, " \Phi"] \\
? \\
\vec{c} \in \\
\vec{e} \in \\
(0, \pi) \\
\theta_e \in \\
(0, \pi) \\
(r_f) \\
(\theta_e) \\
(\theta_e^*) \\
(\vec{e}) \\
\theta_e \\
\vec{\theta} \rightarrow \\
\vec{\theta} \rightarrow \\
C_f, C_{f'} \\
\theta_e \rightarrow \\
0 \\
Q_e \\
\vec{e} \\
(r_f) \\
(\theta_e)
\end{array}$$