36. (a) Since $i = \mathcal{E}/(r + R_{\text{ext}})$ and $i_{\max} = \mathcal{E}/r$, we have $R_{\text{ext}} = R(i_{\max}/i - 1)$ where $r = 1.50\,\text{V}/1.00\,\text{mA} = 1.50 \times 10^3\,\Omega$. Thus, $R_{\text{ext}} = (1.5 \times 10^3\,\Omega)(1/0.10 - 1) = 1.35 \times 10^4\,\Omega$;

(b) $R_{\text{ext}} = (1.5 \times 10^3\,\Omega)(1/0.50 - 1) = 1.50 \times 10^3\,\Omega$;

(c) $R_{\text{ext}} = (1.5 \times 10^3\,\Omega)(1/0.90 - 1) = 167\,\Omega$.

(d) Since $r = 20.0\,\Omega + R$, $R = 1.50 \times 10^3\,\Omega - 20.0\,\Omega = 1.48 \times 10^3\,\Omega$.