

Solve for r . $LED = (R+r)$

$$(R+r) \underline{I} = \frac{E}{\cancel{R+r}} \cdot \frac{\cancel{(R+r)}}{1}$$

$$(R+r) I = E$$

$$\cancel{RI} + rI = E$$
$$\underline{\cancel{-RI} \qquad \qquad \qquad \cancel{-RI}}$$

$$\frac{\cancel{rI}}{I} = \frac{E - \cancel{RI}}{I}$$

$$r = \frac{E - RI}{I}$$

OR

$$r = \frac{E}{I} - \frac{\cancel{RI}}{\cancel{I}}$$

$$r = \frac{E}{I} - R$$