

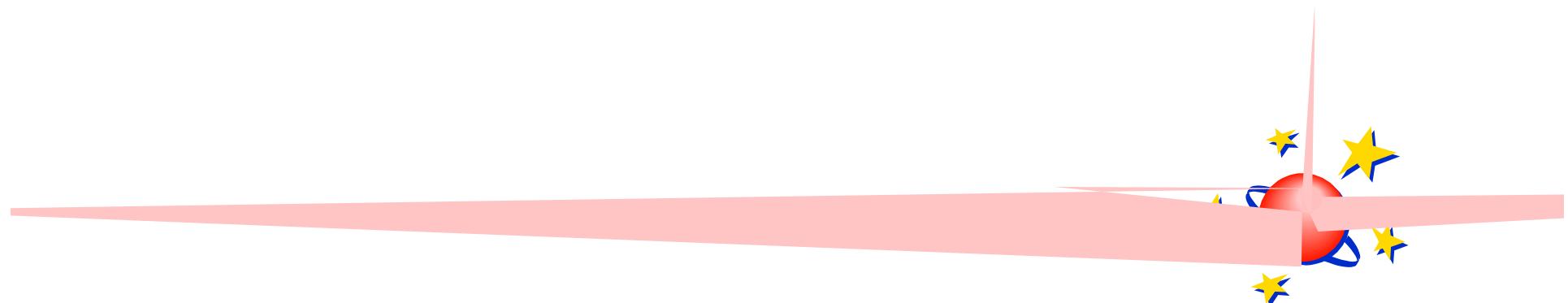


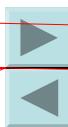
2011-11-1

1



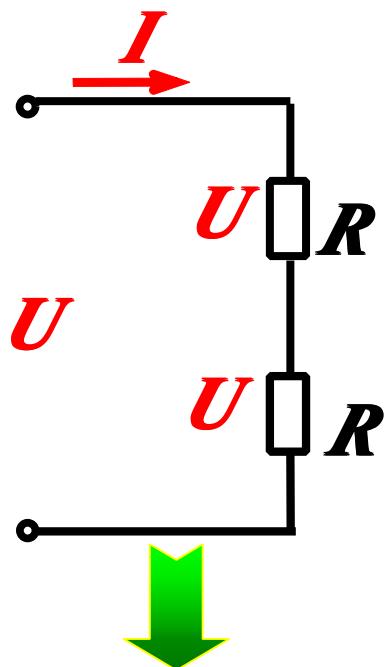
3.



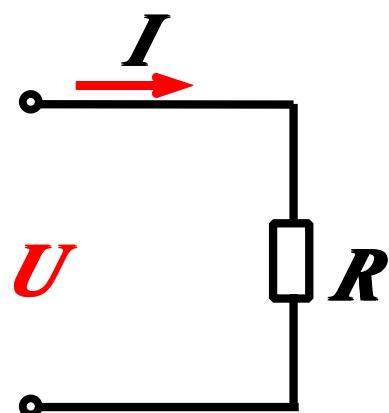


2011-11-1

3

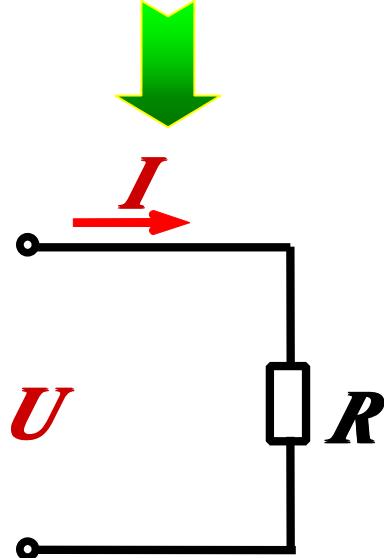
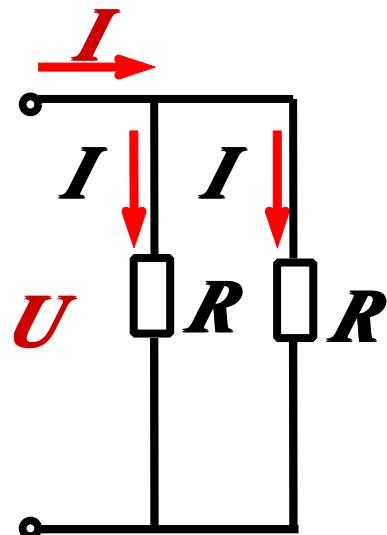


$R \ R \ R$



$$U = \frac{R}{R + R} U$$

$$U = \frac{R}{R + R} U$$



$$\frac{I}{R} \quad \frac{I}{R} + \frac{I}{R}$$

$$I = \frac{R}{R + R} I \quad I = \frac{R}{R + R} I$$

***U***

$$R'' =$$

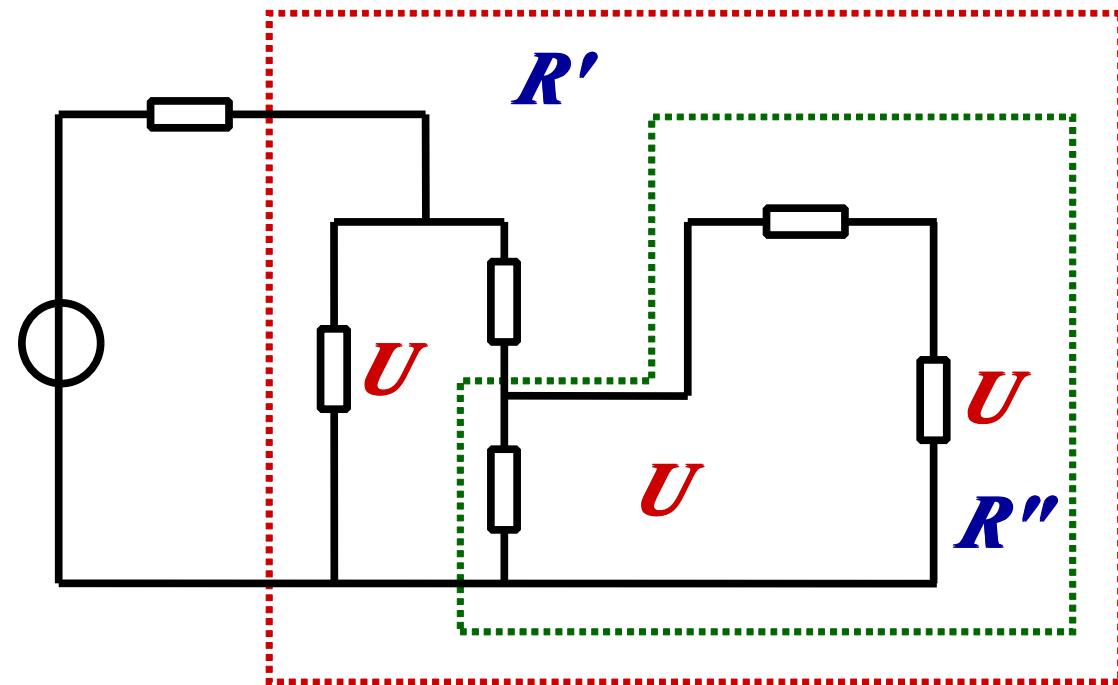
$$R' =$$

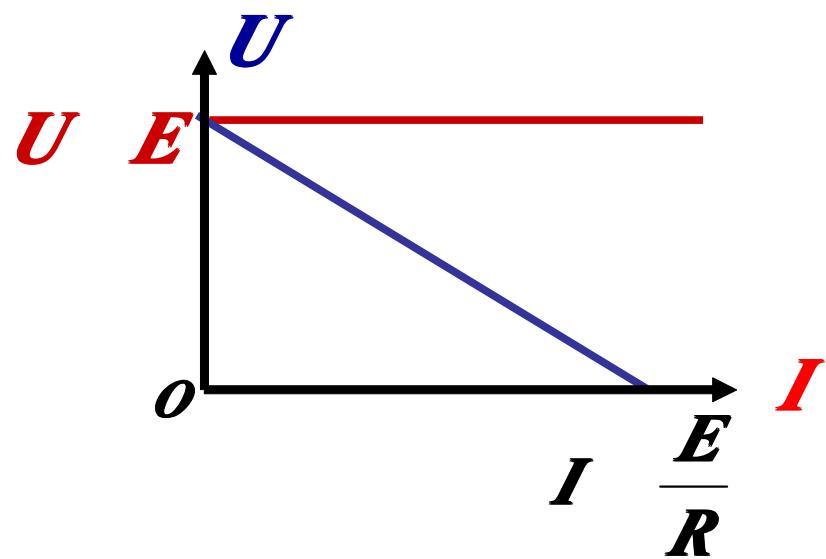
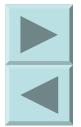
$$U = \frac{R'}{R'} \times$$

=

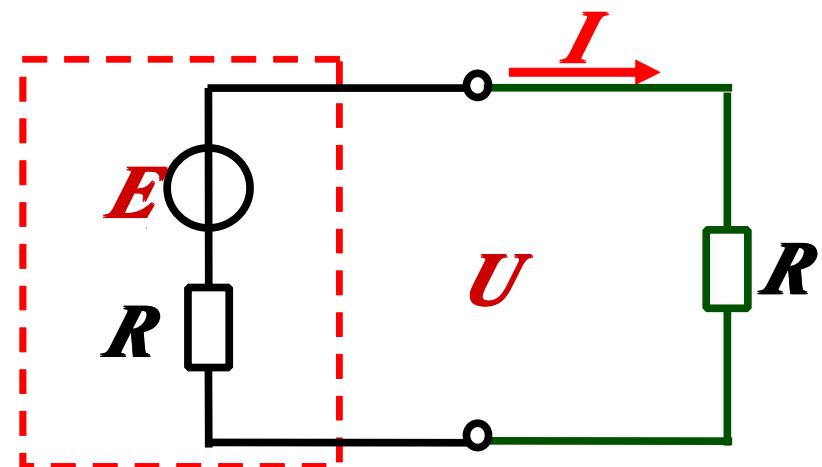
$$U = \frac{R''}{R''} \times U =$$

$$U = \underline{\hspace{2cm}} \times U =$$





$R$

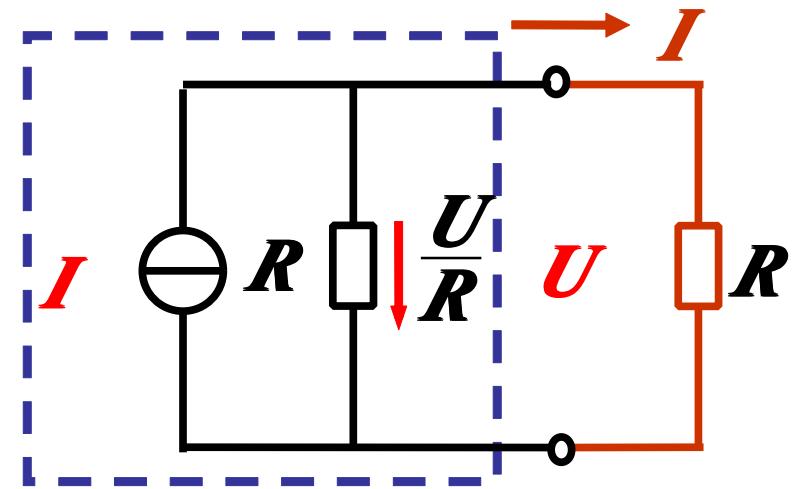
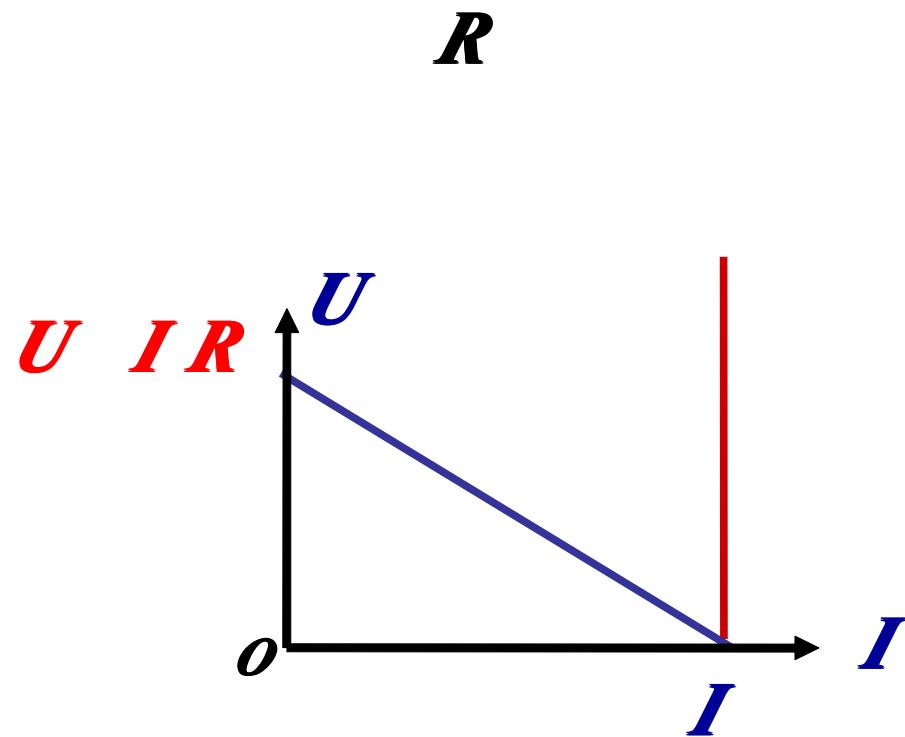
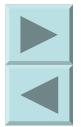


$$U = E - IR$$

$R$

$$R = \frac{E}{U}$$

$$\begin{array}{ll} U & E \\ R & U \end{array}$$



$$I = I - \frac{U}{R}$$

$R$

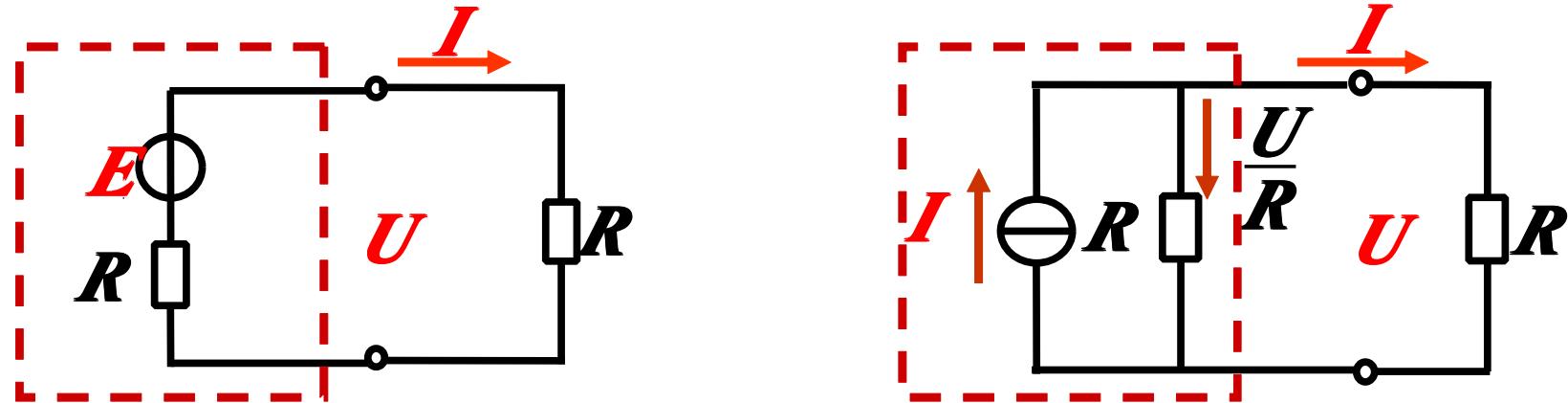
$I$   $I$

$R$

$R$

$I$

$I$

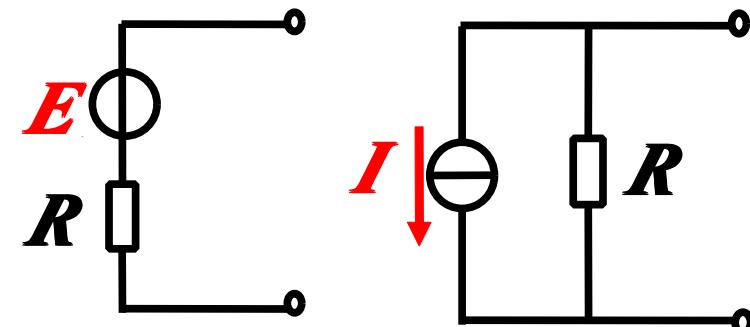
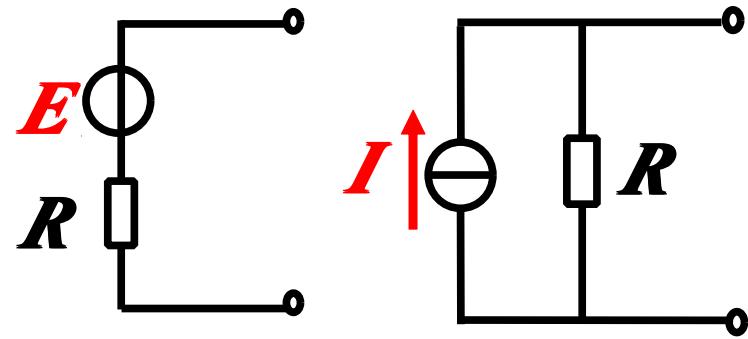


$$U \quad E \quad IR$$

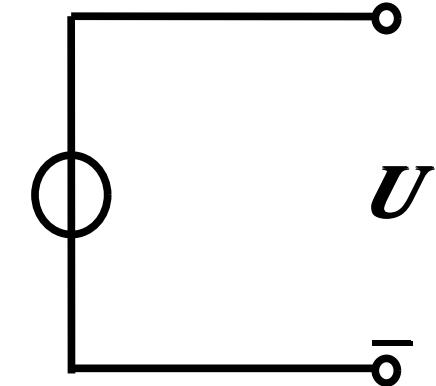
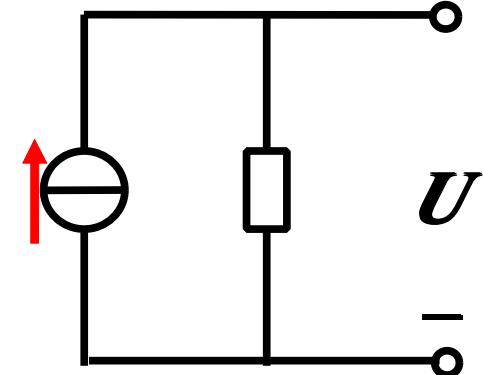
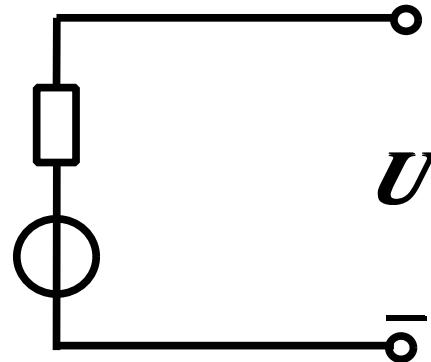
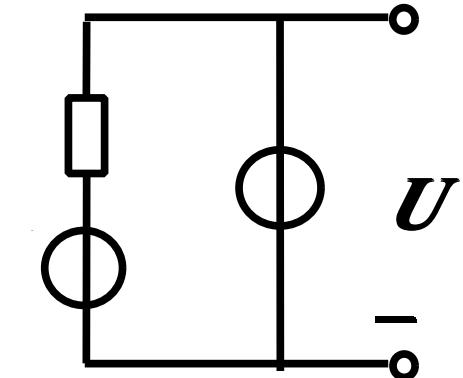
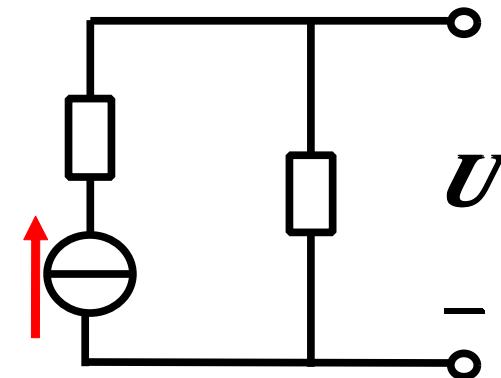
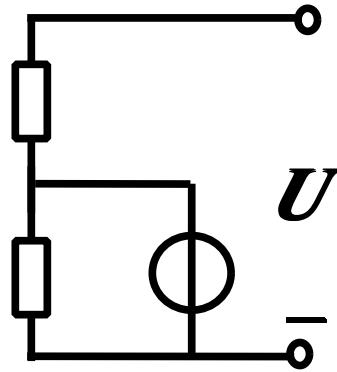
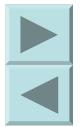
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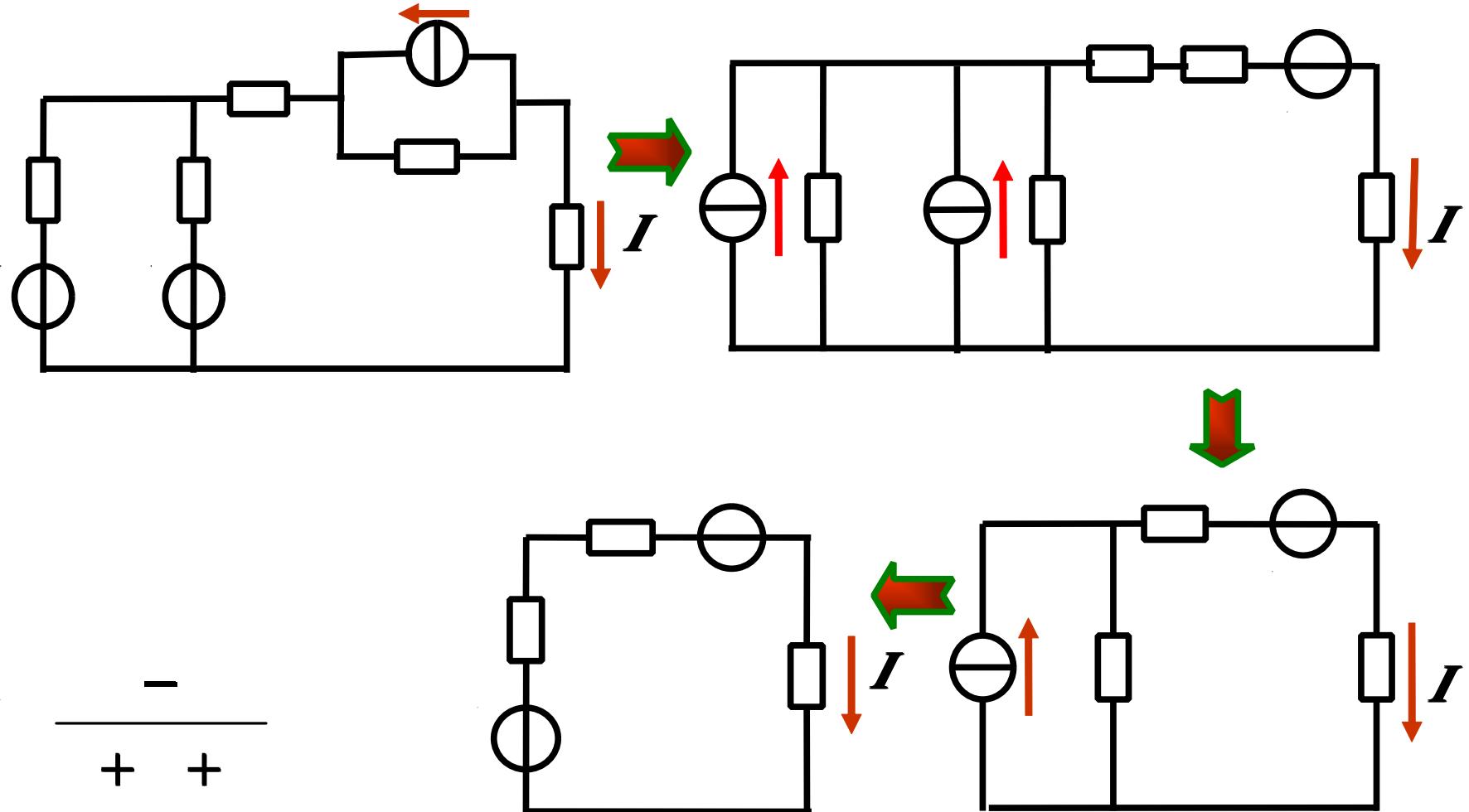
= —

$$\left\{ \begin{array}{l} E \quad IR \\ I \quad \frac{E}{R} \end{array} \right.$$

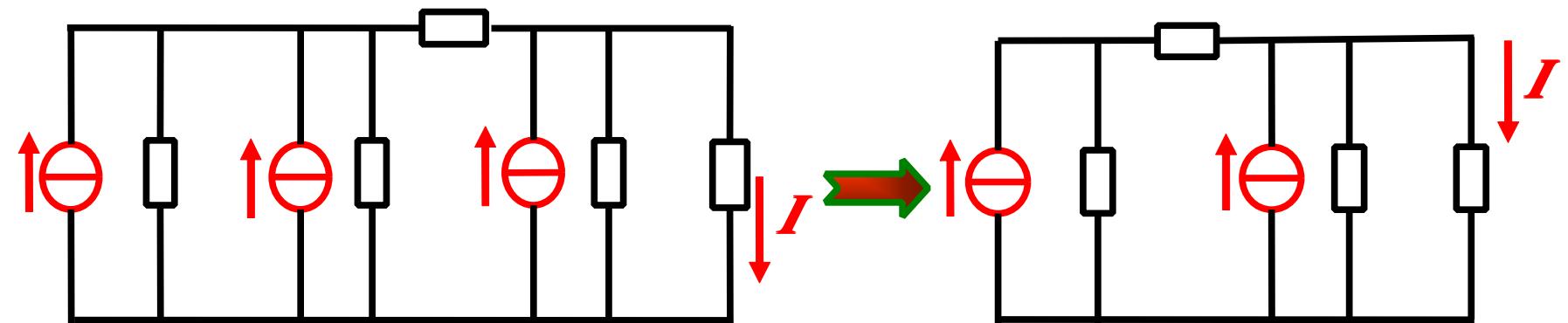
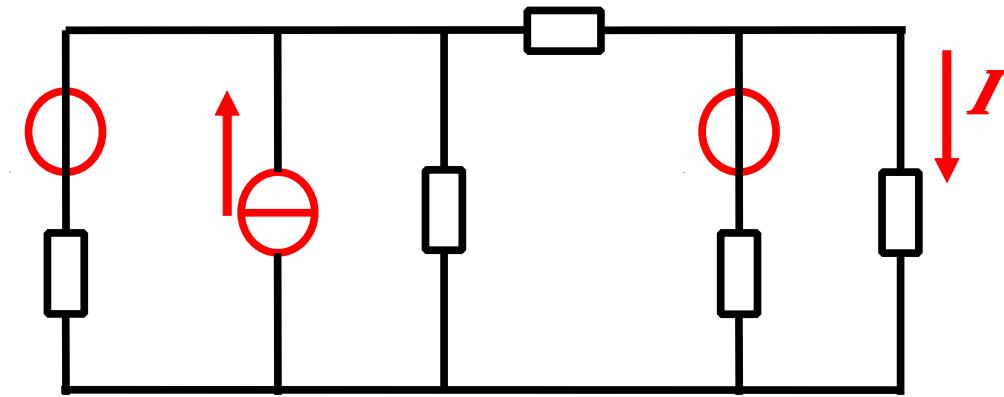


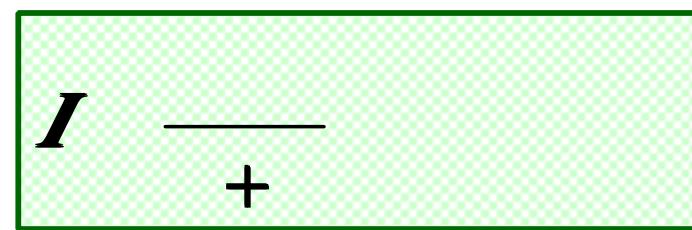
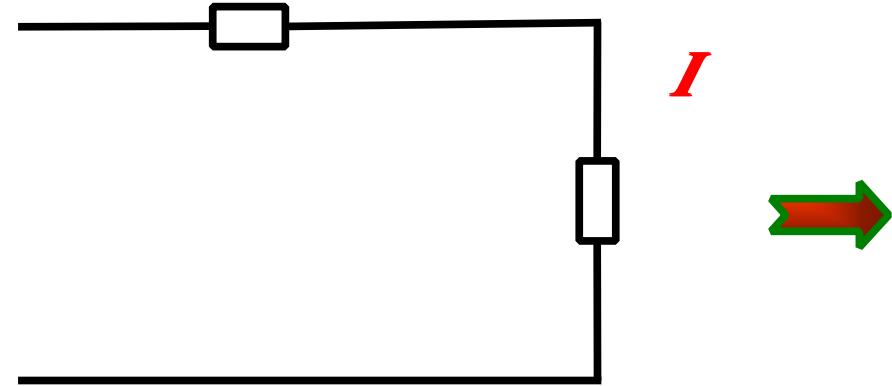
***E***  
***I***

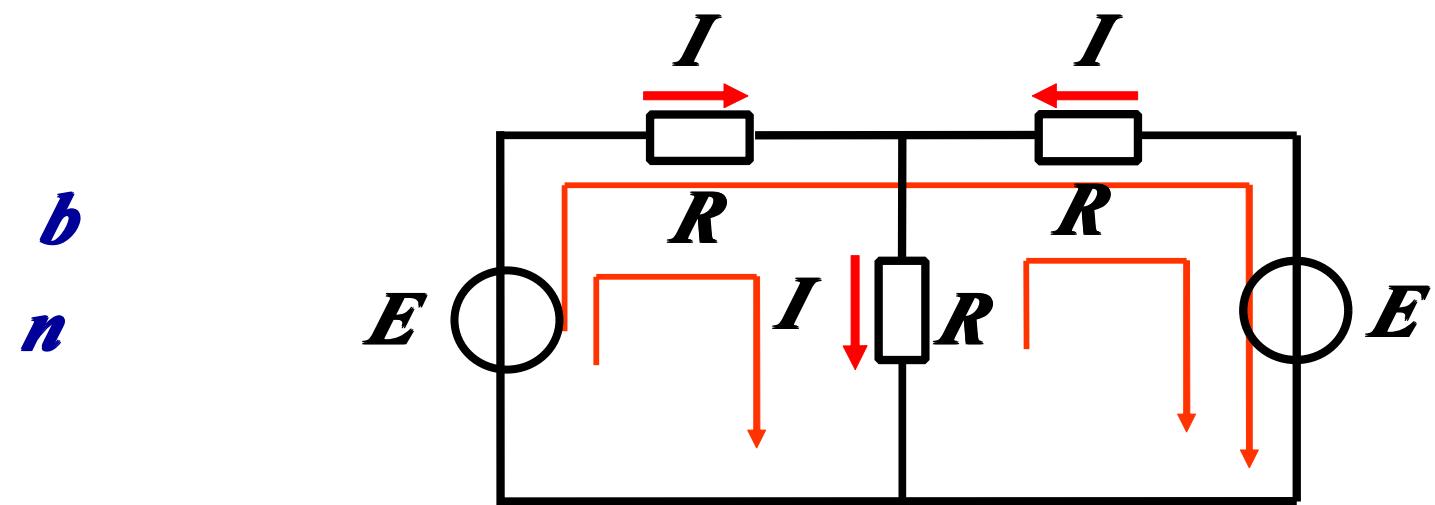
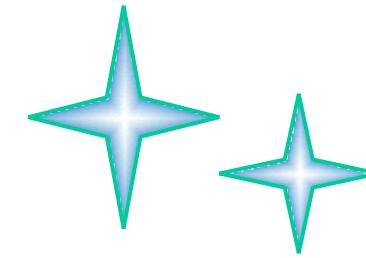




$$I \begin{array}{c} - \\ \hline + + \end{array}$$

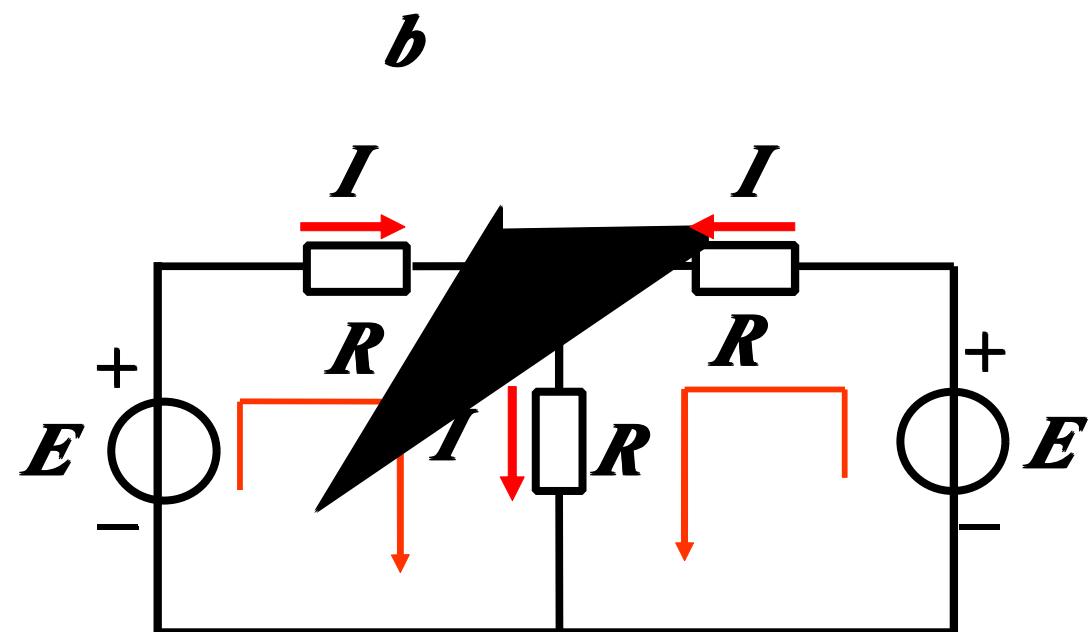




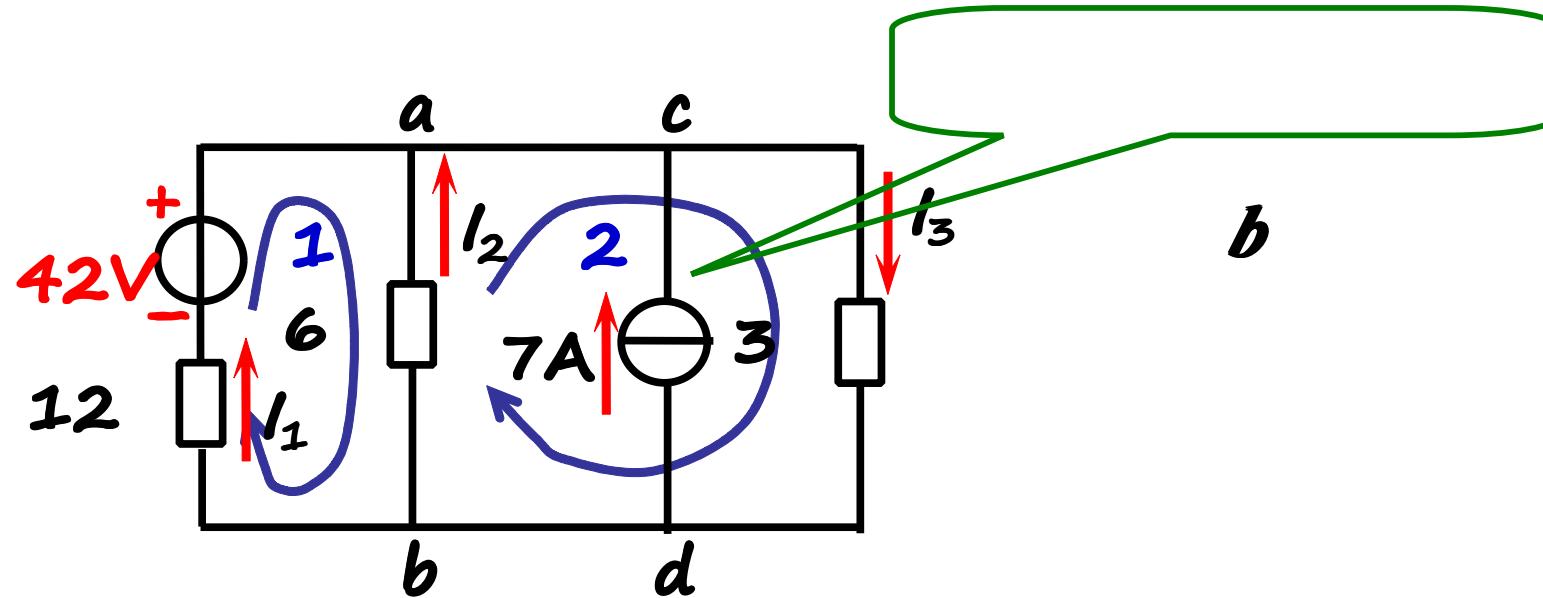


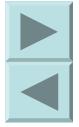


*n*  
*b n*

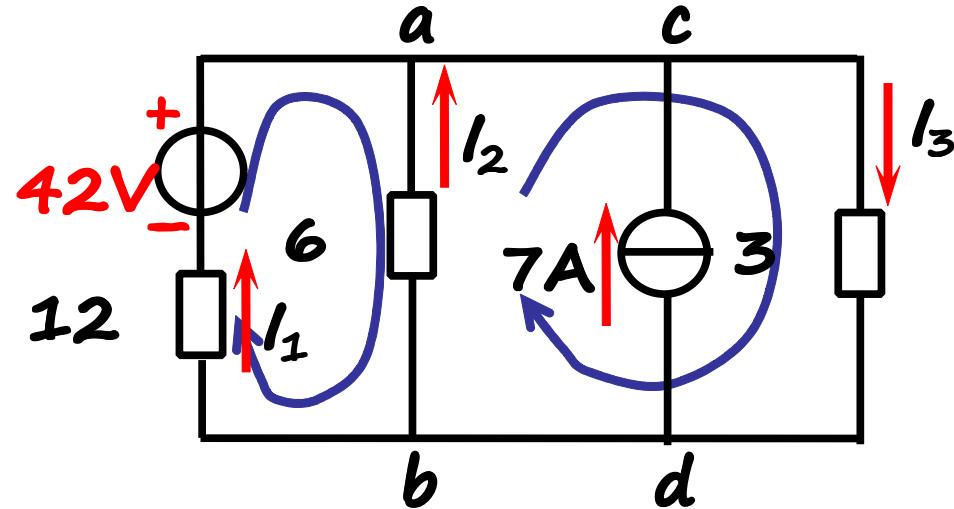


$$\begin{array}{ccc} I & I & I \\ IR & IR & E \\ IR & IR & E \end{array}$$





b



$$I \quad I \quad I$$

$$\begin{matrix} I & & I \\ I & & I \\ I & & I & I \end{matrix}$$

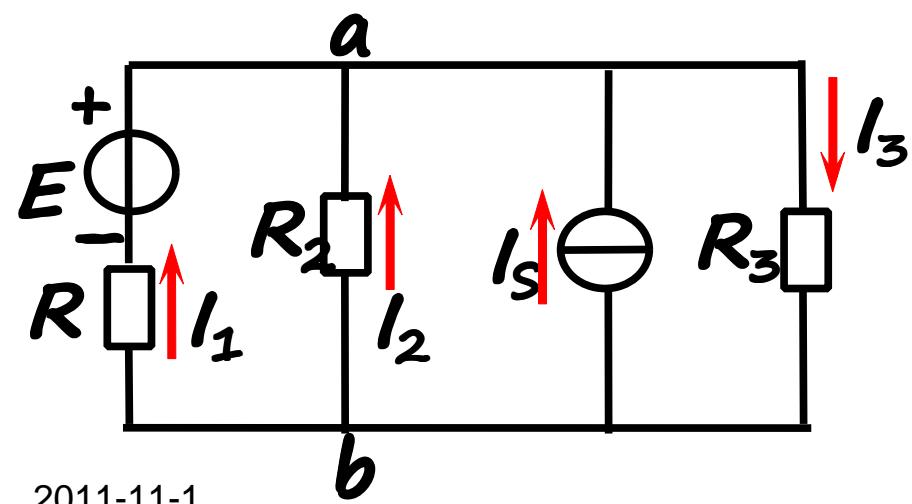


*b*



*n*

11-11-1



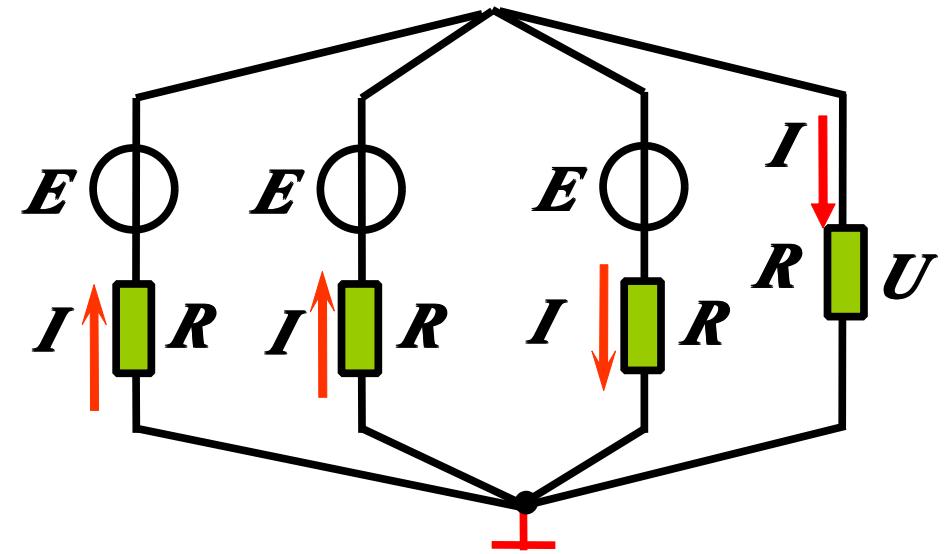
2011-11-1

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$$V \quad U$$

$$I \quad I \quad I \quad I$$

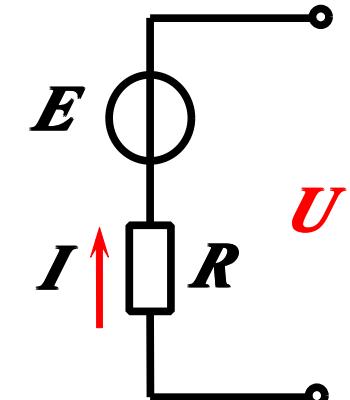


$$I = \frac{E - U}{R}$$

$$I = \frac{-E + U}{R} \quad I = \frac{U}{R}$$

$$U = E - IR$$

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





$$\frac{-}{R} + \frac{-}{R} - \frac{-}{R} + \frac{+}{R} =$$

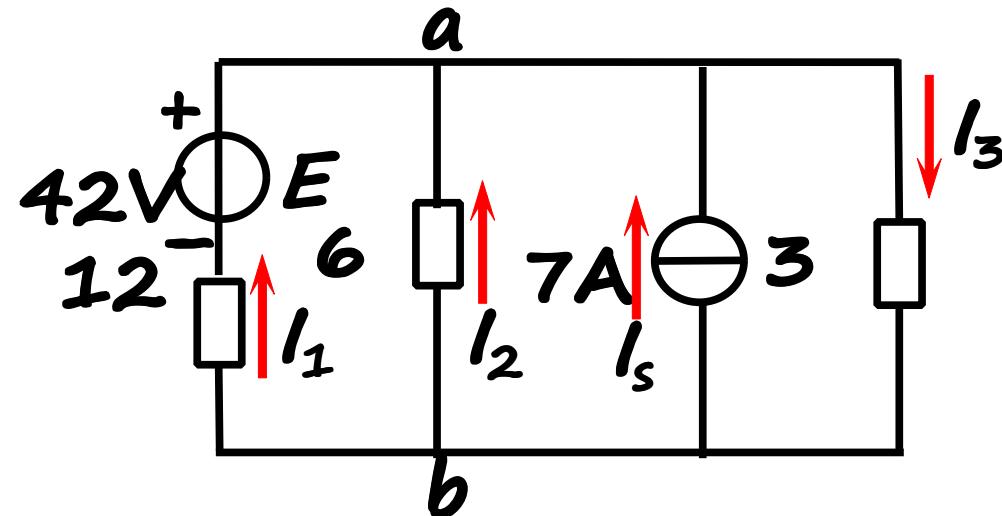
$$U \frac{\frac{E}{R} + \frac{E}{R} + \frac{E}{R}}{\frac{-}{R} + \frac{-}{R} + \frac{-}{R} + \frac{+}{R}}$$

$$U \frac{\frac{E}{R}}{\frac{-}{R}}$$

**E**



***U***



***U***

$$\frac{\frac{E}{R} + I}{\frac{1}{R} + \frac{1}{R} + \frac{1}{R}}$$

$$I = \frac{-U}{R}$$

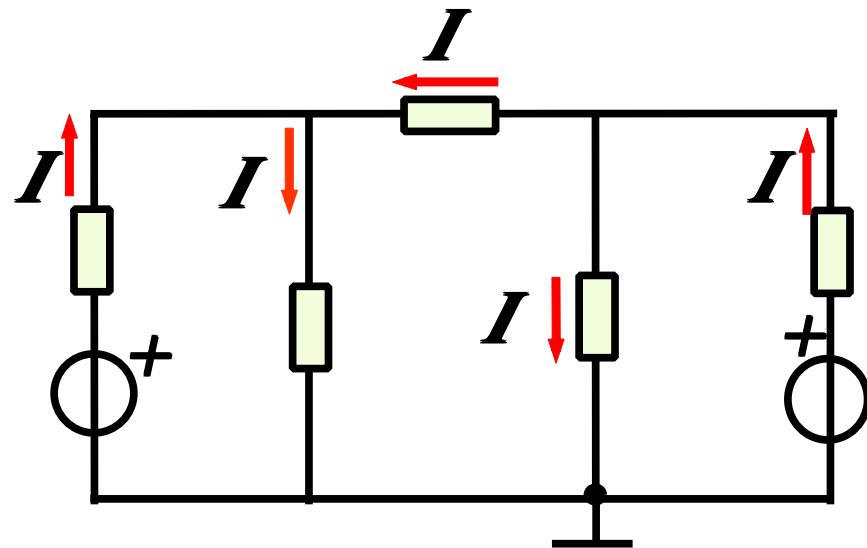
$$I = U$$

$$I = \frac{U}{R}$$

$$U = \dots$$

$$I = \frac{U}{R}$$

$$U = \dots$$



$$\left\{ \begin{array}{ccc} I & I & I \\ I & I & I \end{array} \right.$$

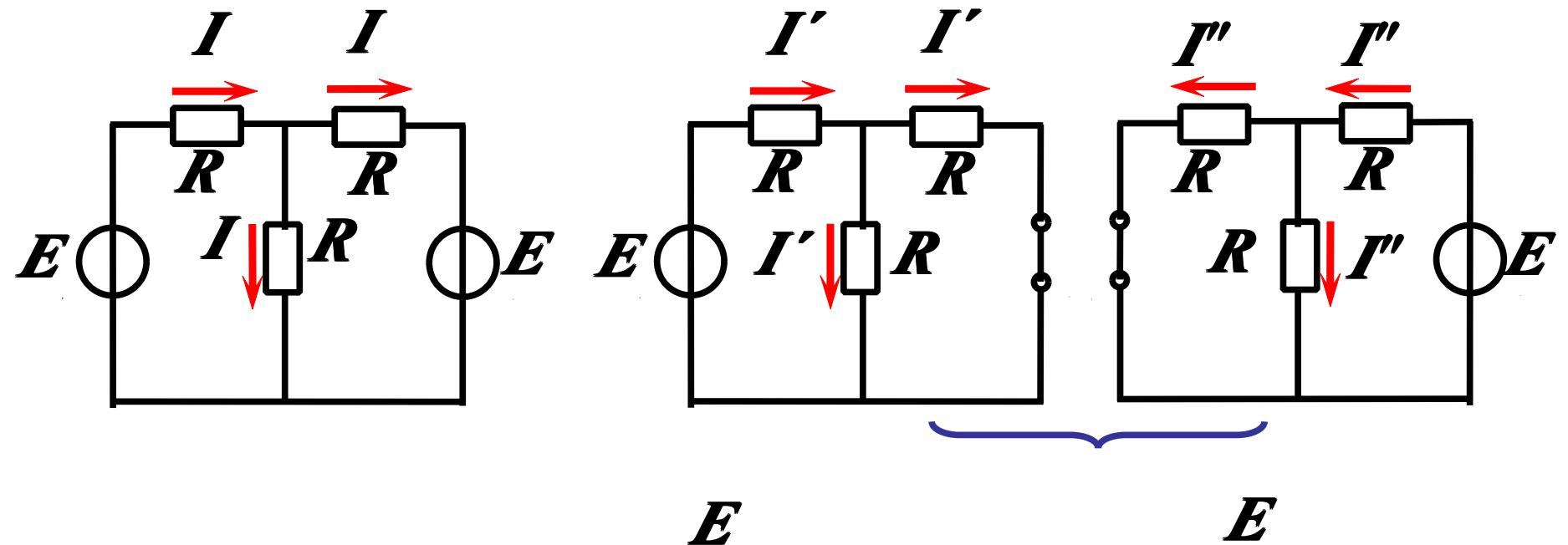
$$\left\{ \begin{array}{ccc} V & V \\ V & V \end{array} \right.$$

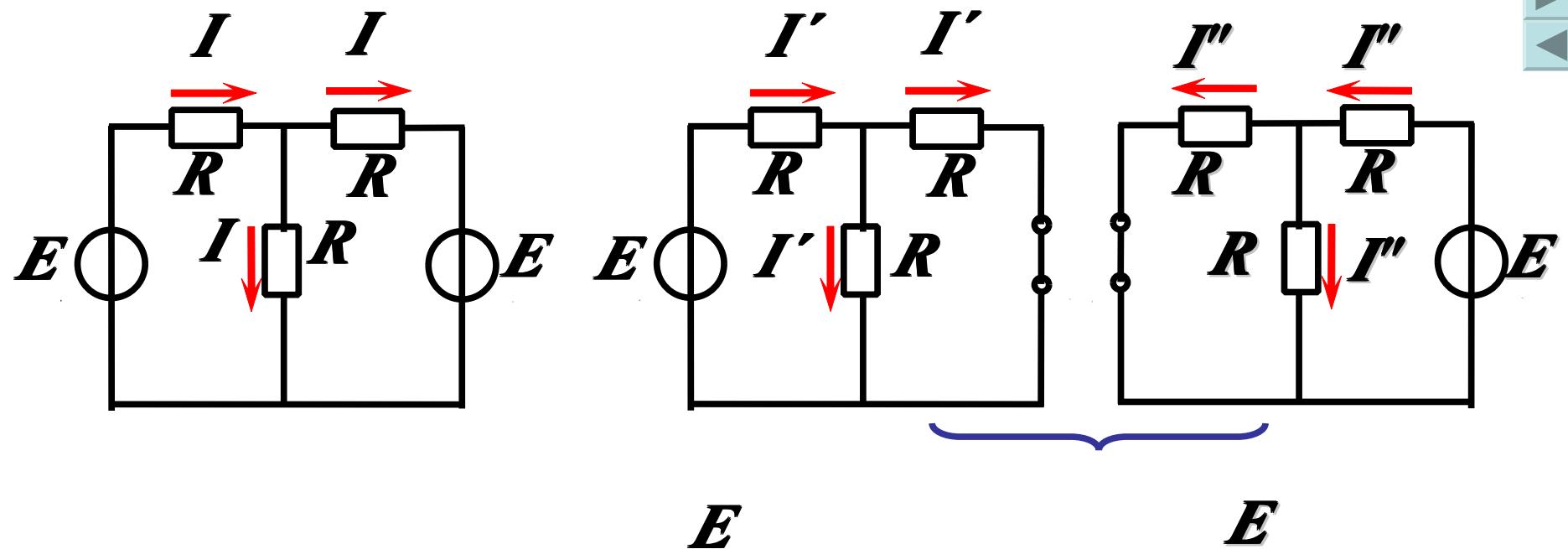
2011-11-1

$$I = \frac{-V}{V - V}$$

$$I = \frac{-V}{V}$$

$$\begin{matrix} V \\ V \end{matrix}$$



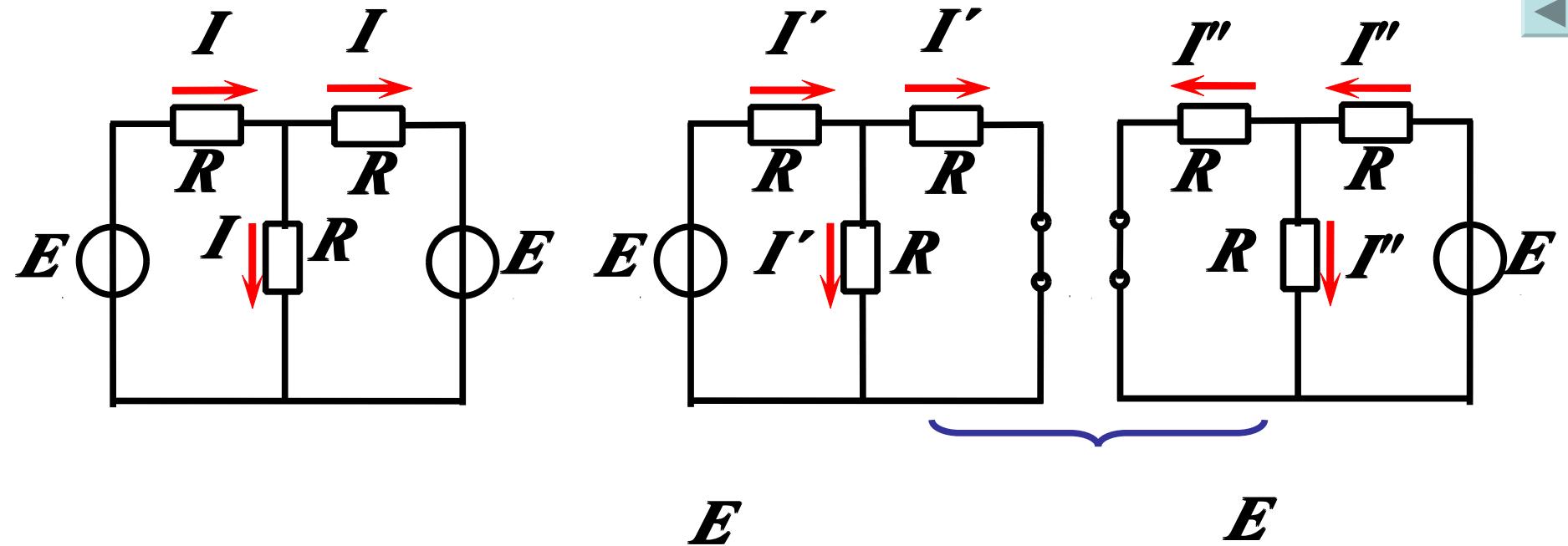


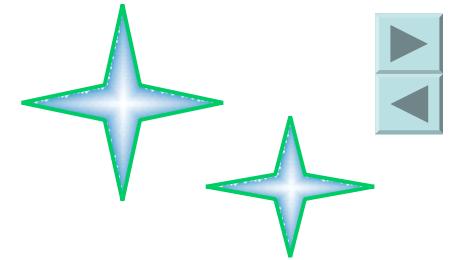
**E**

$$I' = \frac{E}{R + R // R} = \frac{R + R}{RR + RR + RR} E$$

**E**

$$I = \frac{R}{R + R} = \frac{E}{R + R} = \frac{R}{RR + RR + RR} E$$





**$P$**   
 $P \quad I \ R \quad I + I \quad R \quad I \ R + I \quad R$

**$E$**                             **$I$**



$$E =$$

$$I$$

$$R =$$

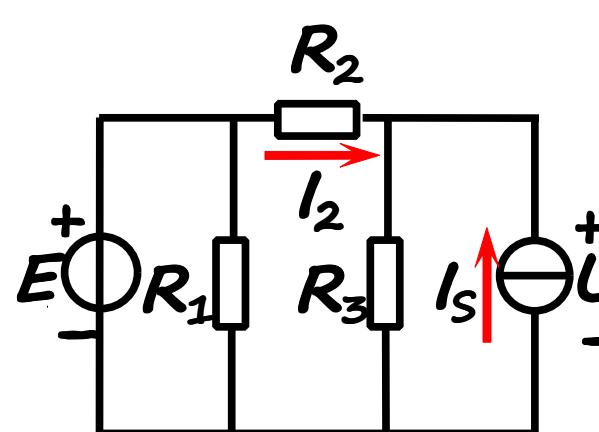
$$R = R =$$

$$I$$

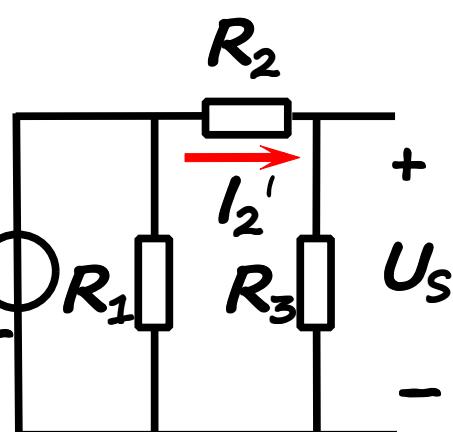
$$U$$

$$R$$

$$I$$

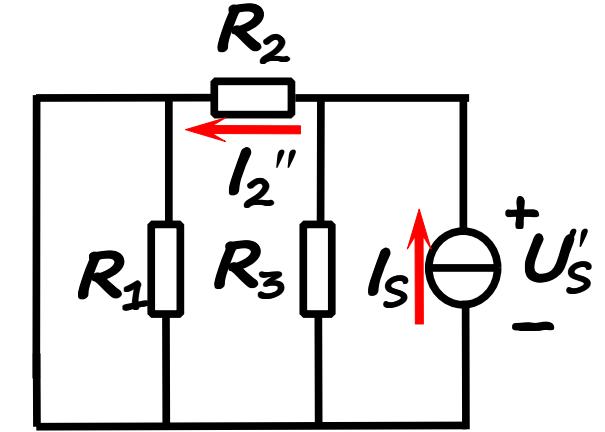


(a)



$E$

$I$

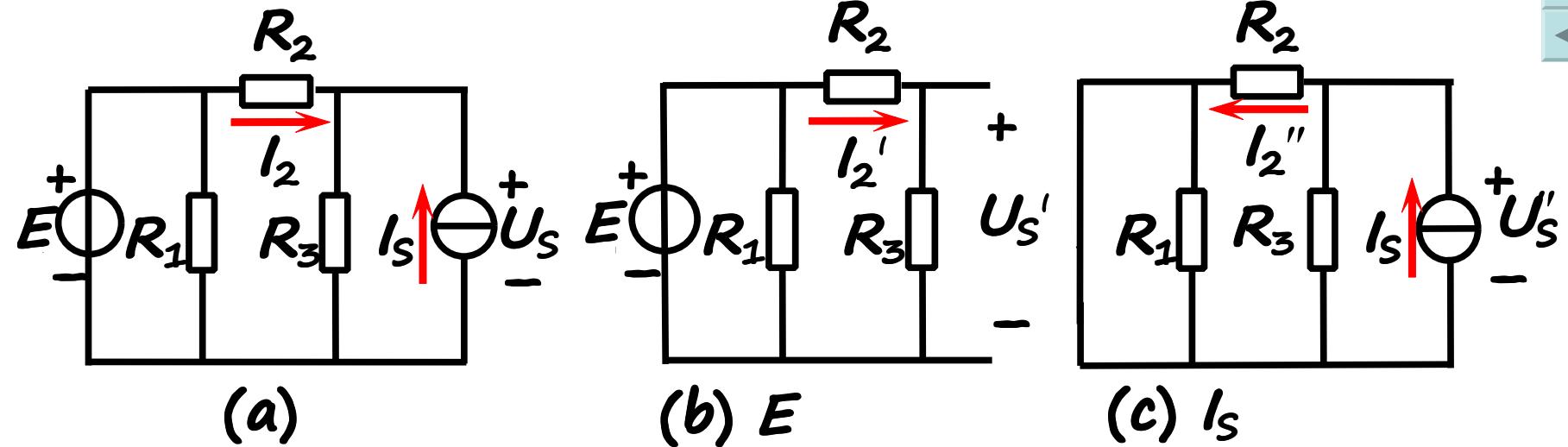


$I$

$E$

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

$$U = IR$$



$$I - \frac{R}{R + R} I =$$

$$'' = '' = \times =$$

$$I - I - =$$

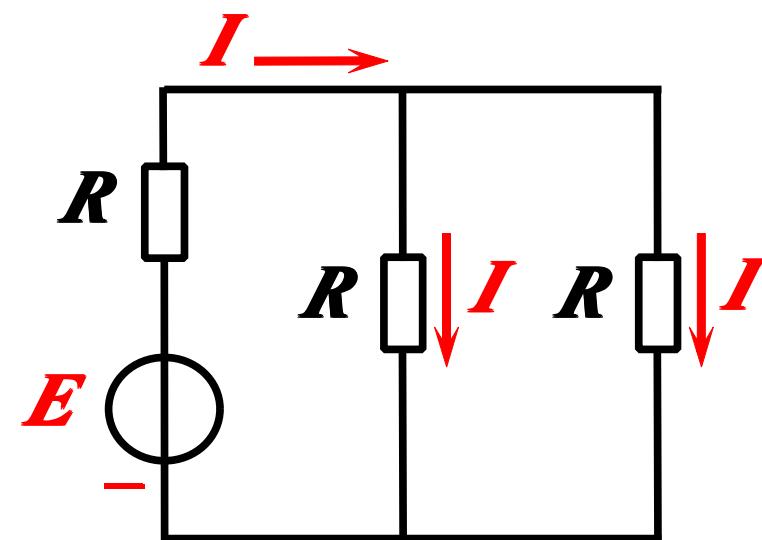
$$U - U + U =$$





$k$

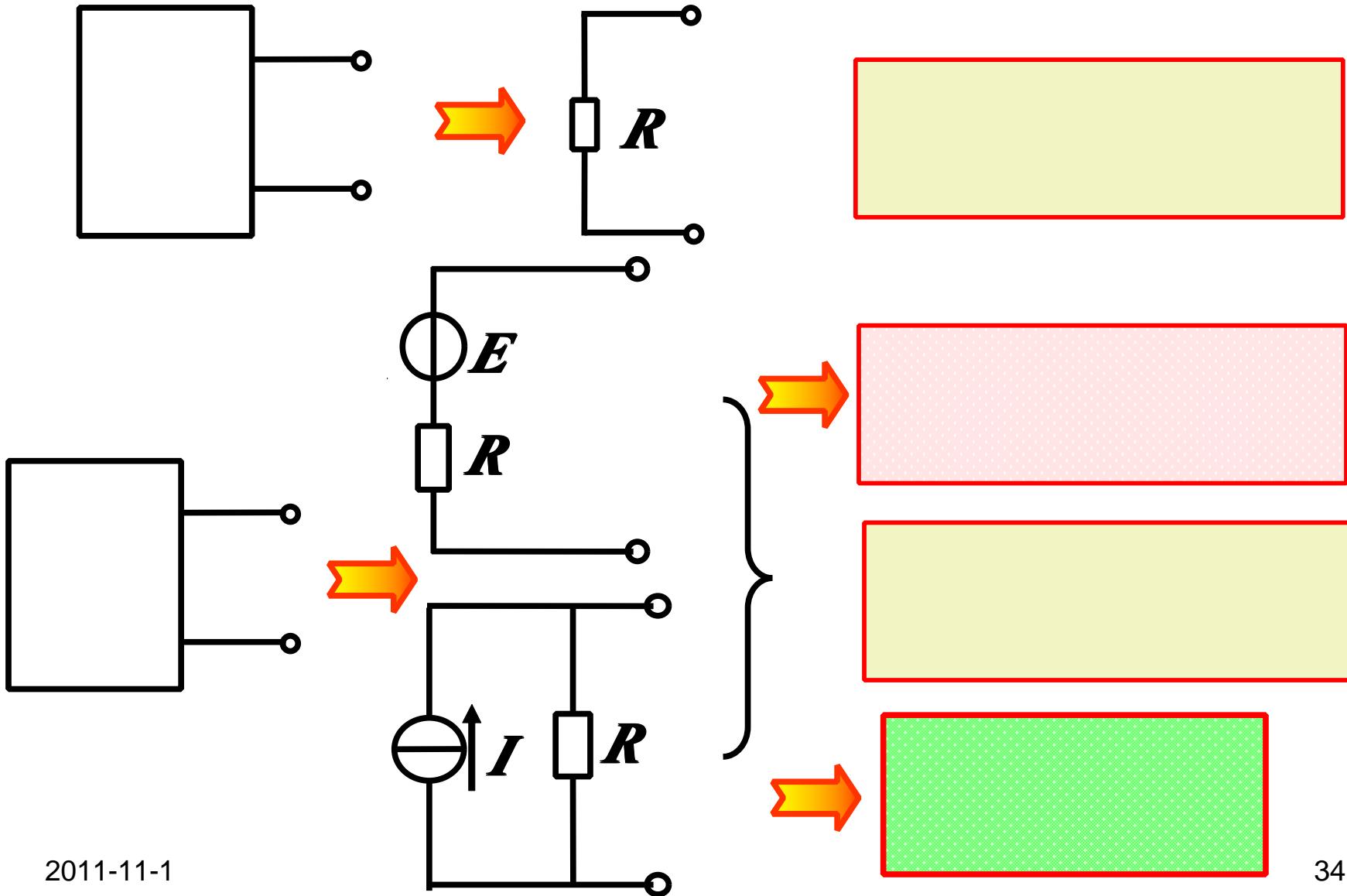
$k$

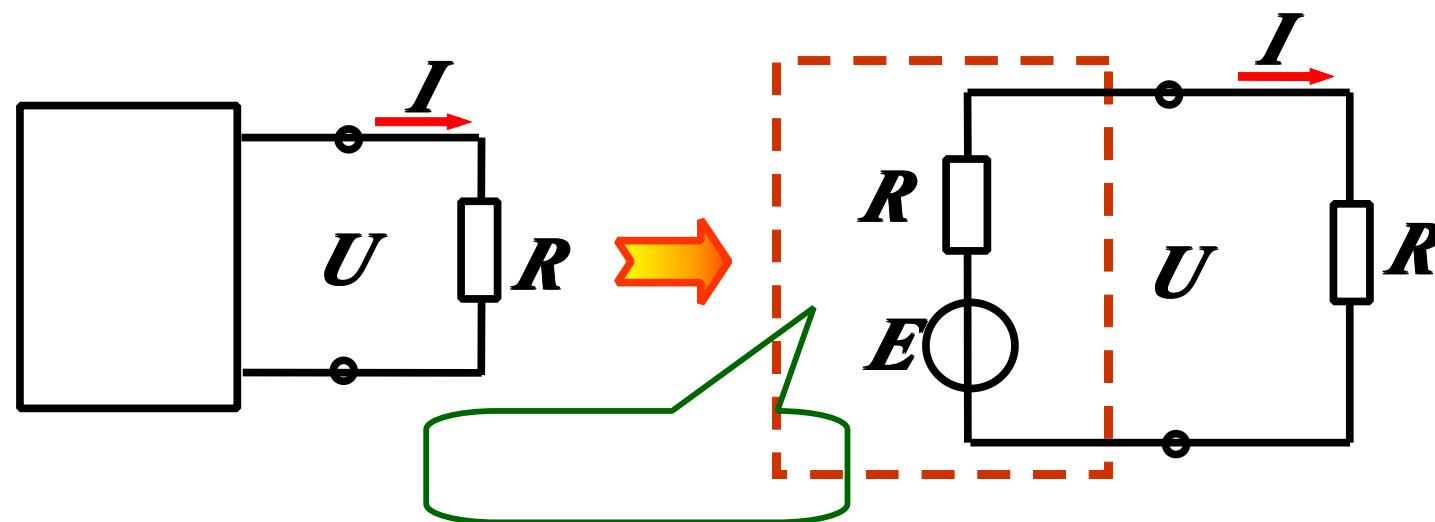


$E$

$n$

$n$



$E$  $R$  $E$  $U$  $R$ 



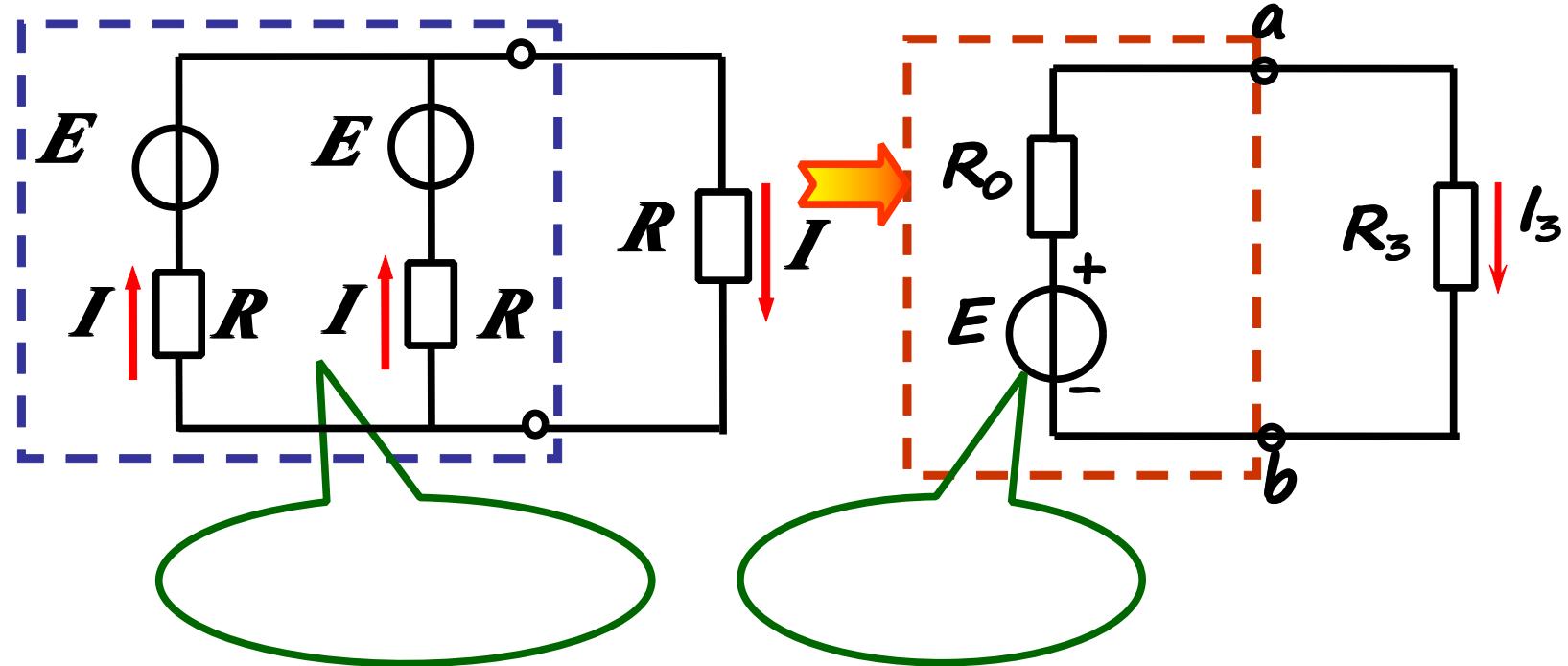
**R**

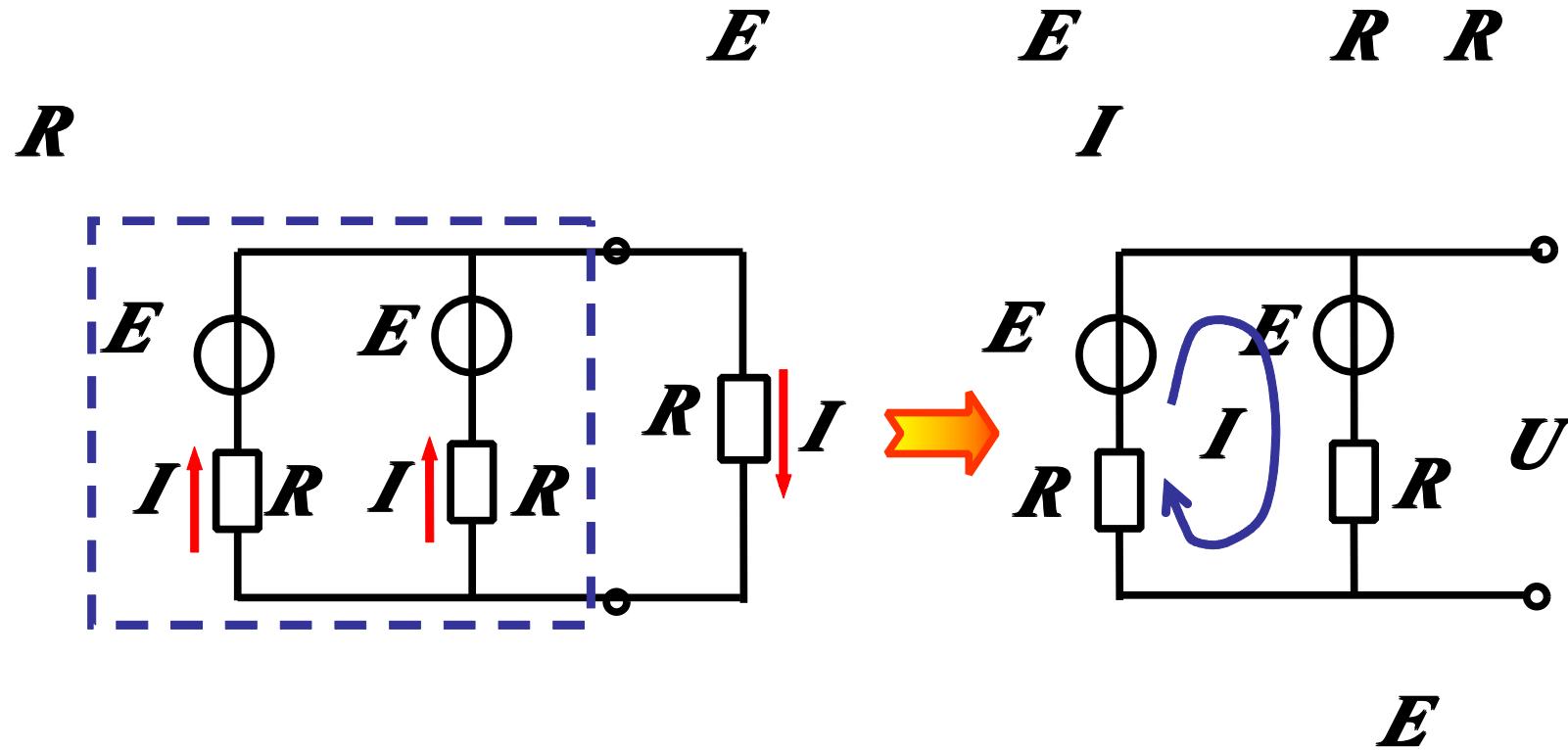
**E**

**E**

**R R**

**I**





$$I \quad \frac{E - E}{R + R} \quad -$$

$$E \quad U \quad E + IR$$

$$E \quad U \quad E - IR$$

***E***



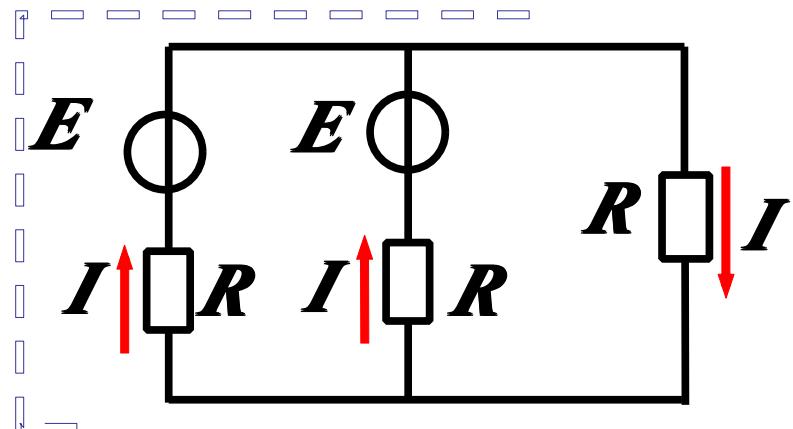
$E$

$E$

$R \quad R$

$R$

$I$



$R$



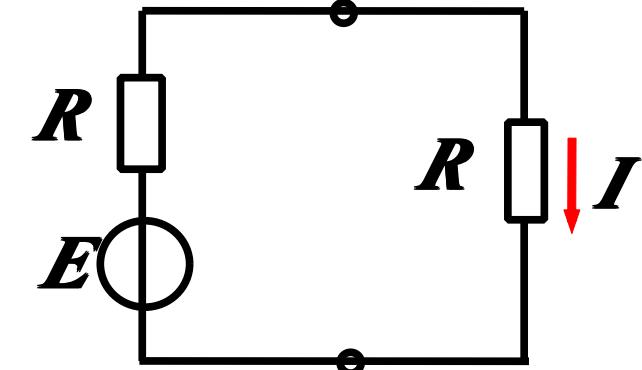
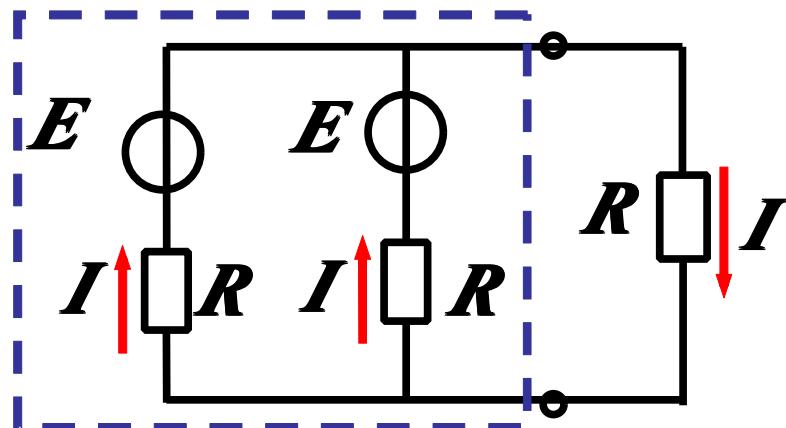
$E$

$E$

$R$   $R$

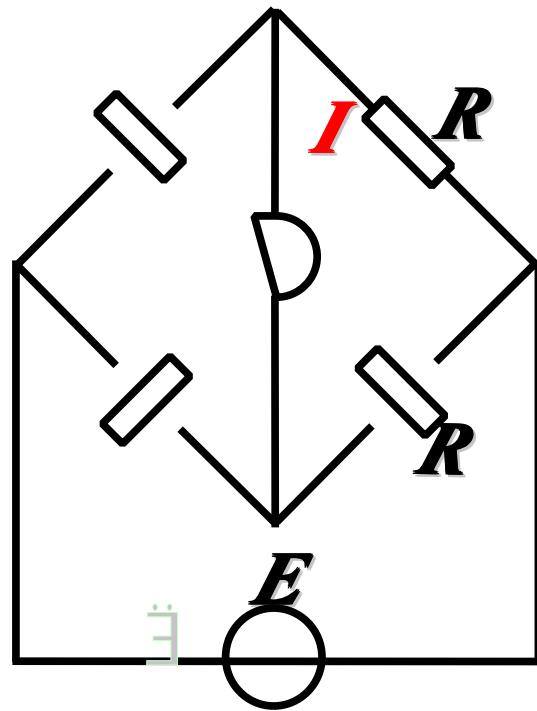
$R$

$I$



$I$

$$I = \frac{E}{R+R} +$$



$R$

$R$

$E$

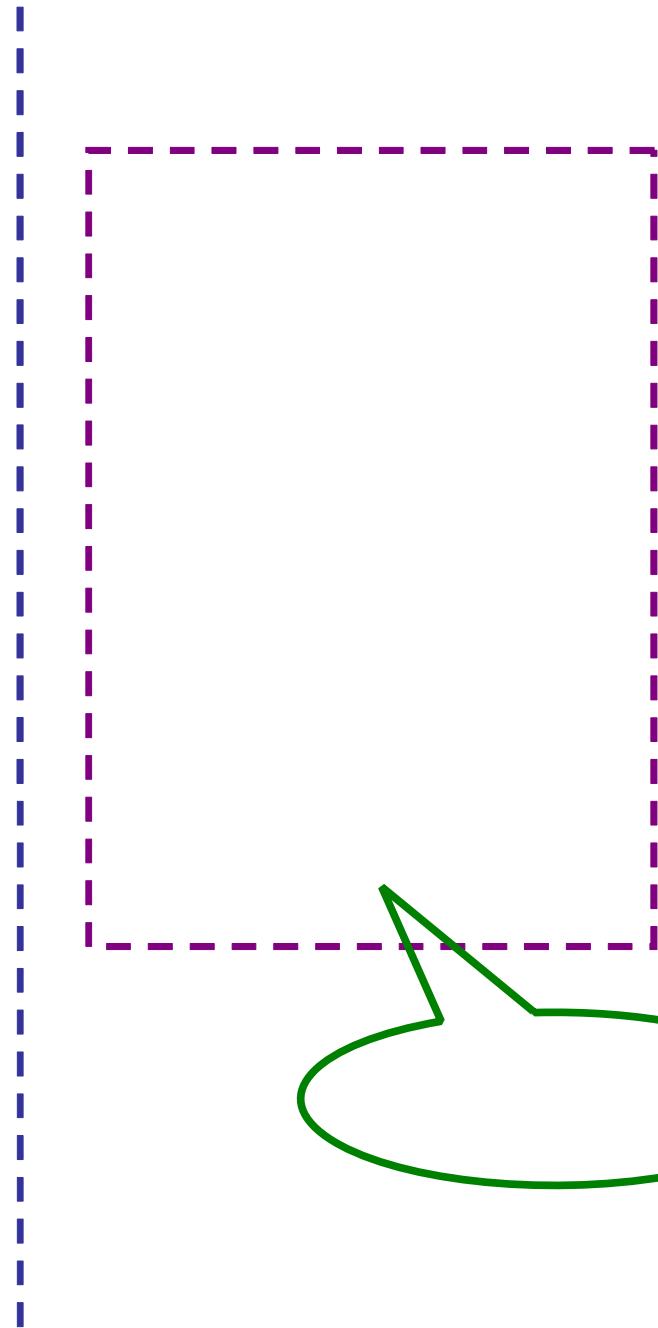
$R$

$R$

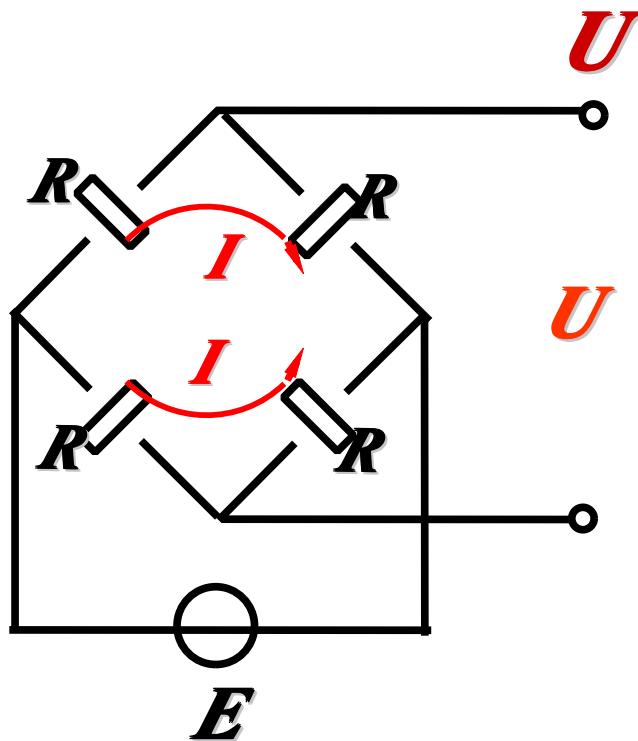
$R$

$I$

2011-11-1



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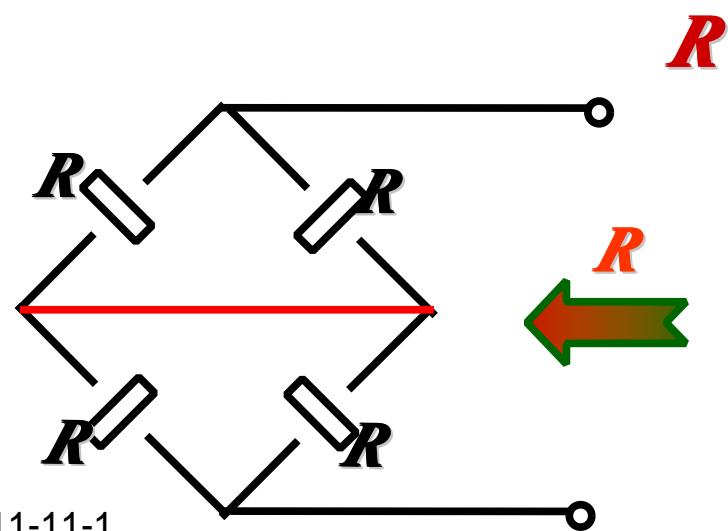


$$I \frac{E}{R+R} -$$

$$I \frac{E}{R+R} +$$

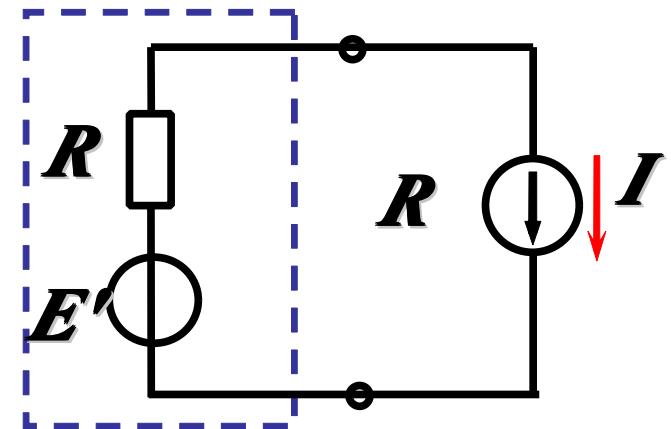
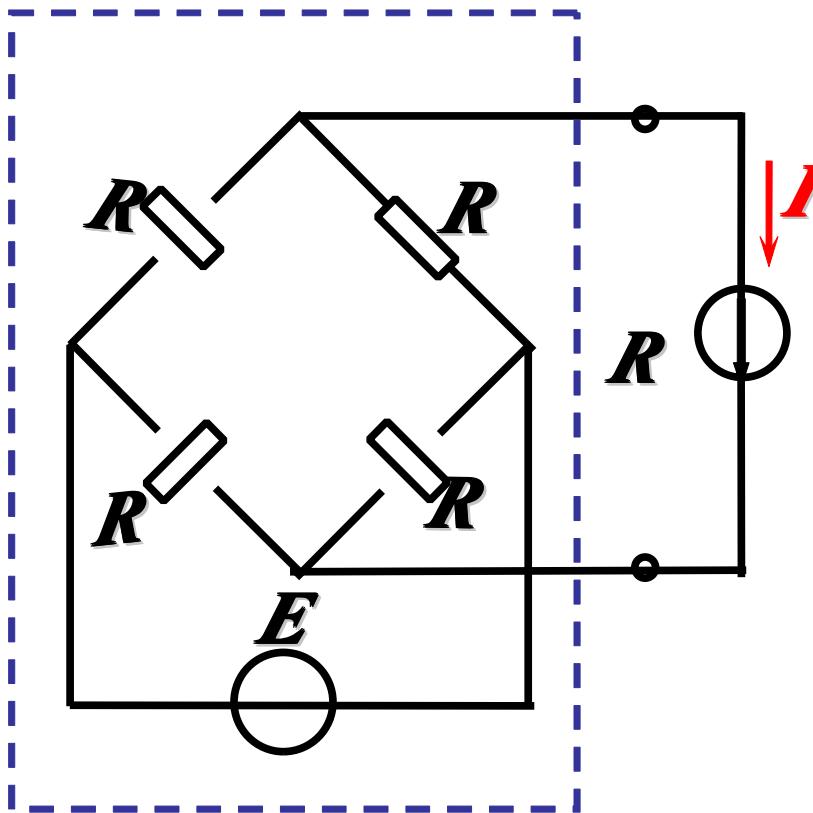
$$E' U IR - IR$$

$$E' U IR - IR$$



$$R R R R$$

$$\frac{R R}{R+R} + \frac{R R}{R+R}$$



**$I$**

$$I = \frac{E}{R + R} +$$

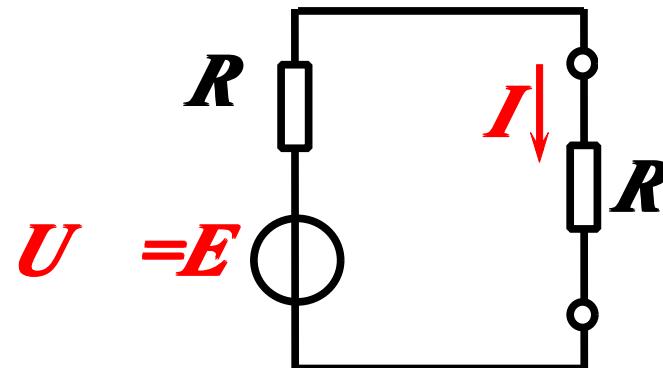
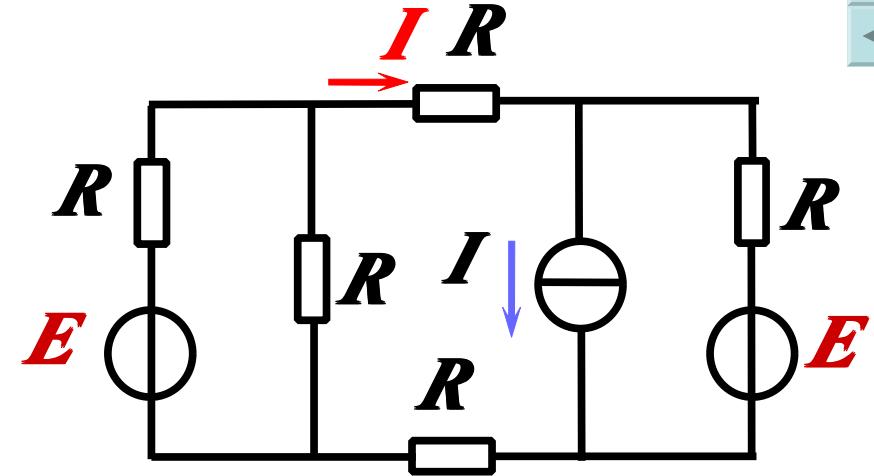


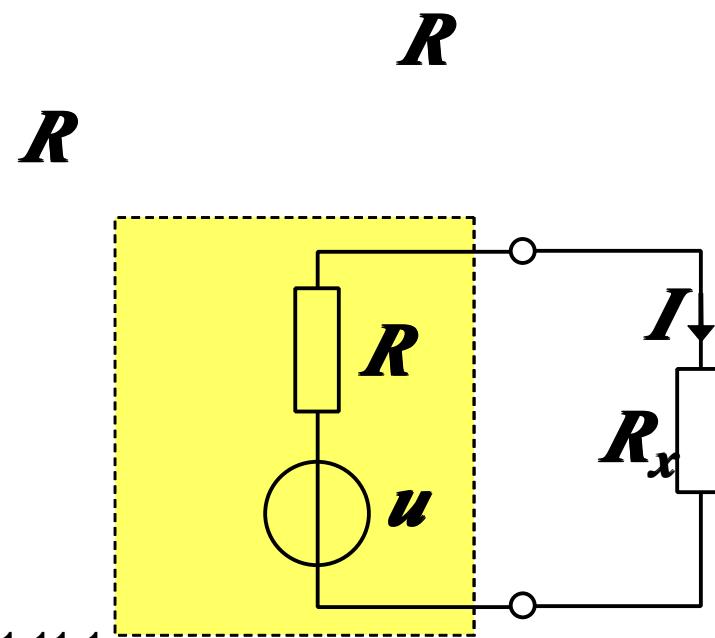
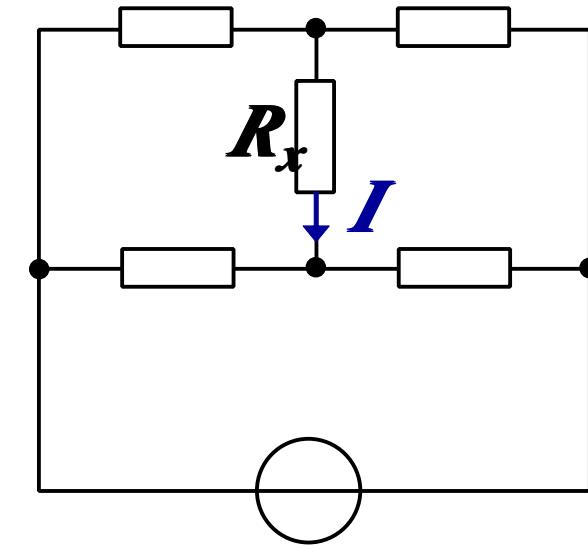
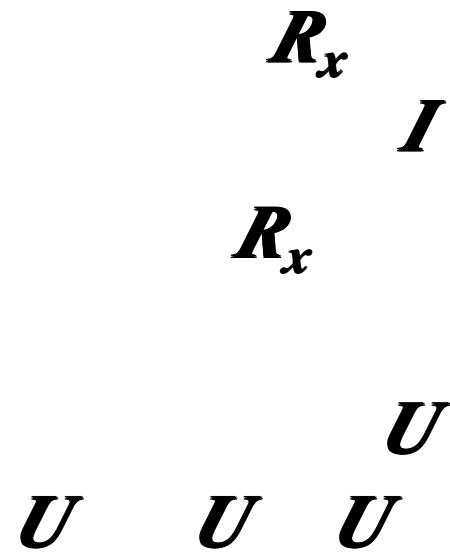
$$\begin{array}{ccccc}
 & R & R & R & \\
 R & & R & & E \\
 E & & I & & \\
 & U & & &
 \end{array}$$

$$\begin{array}{cccc}
 I & \frac{E}{R} & & \\
 U & IR & E & IR \\
 & R & &
 \end{array}$$

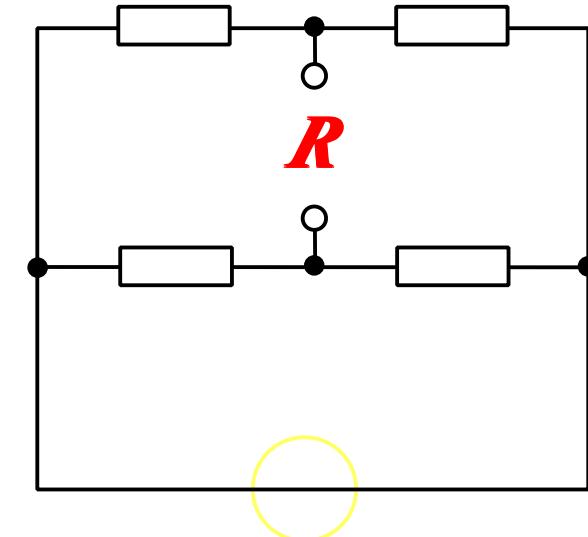
$$\begin{array}{cccc}
 R = R & R & R & R \\
 I = \frac{E}{R} = 
 \end{array}$$

*I*





2011-11-1



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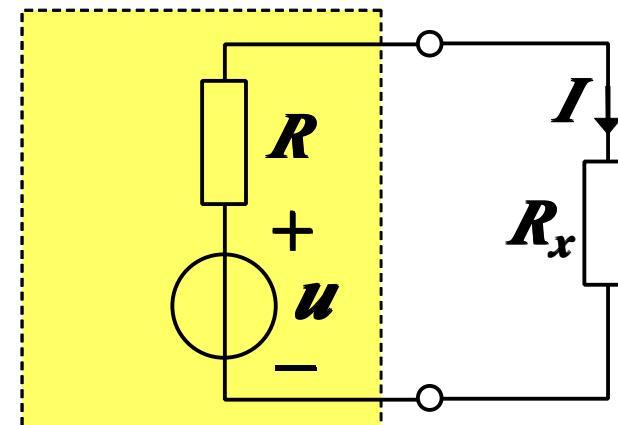
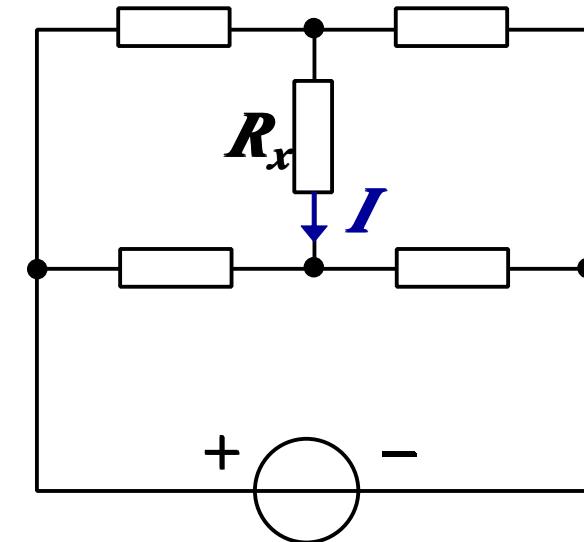
$$R_x$$

*I*

$$R_x$$

$$I \quad \frac{U}{R - R_x}$$

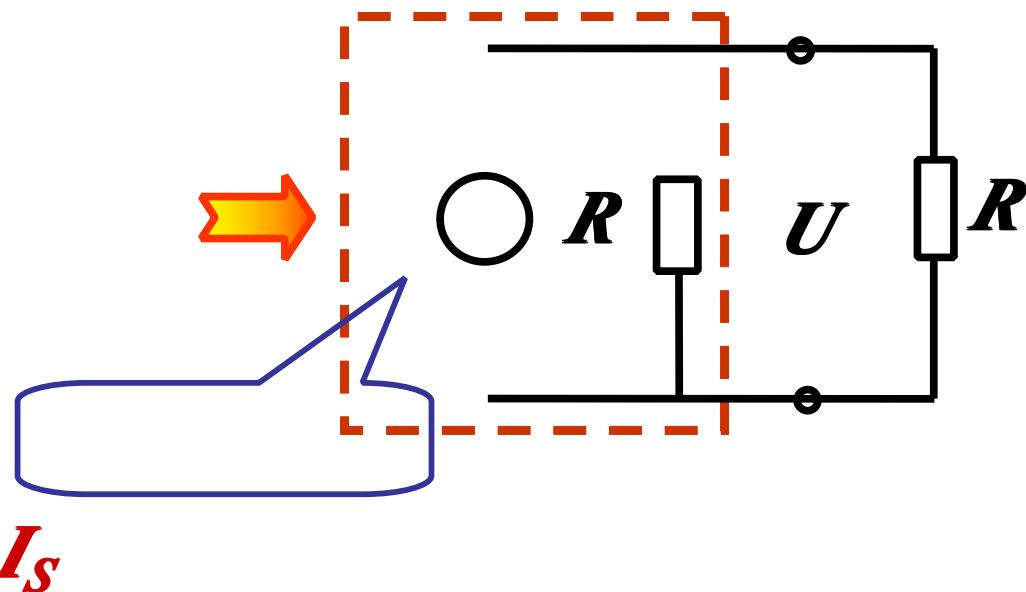
$$I \quad \frac{U}{R - R_x}$$





$I_S$

$R$



$R$



**R**

**R**

**E**

**I**

**R**

**R**

**R**



**I**

**R      I      R**

**E            R      R**  
**R      R**

**R      R      R      R      R**

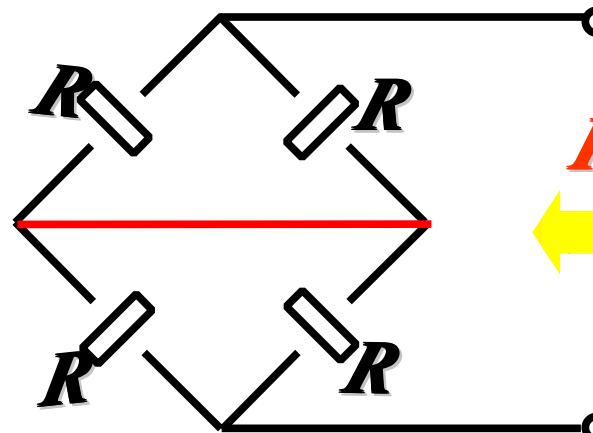
**I      E      —**  
**R**

$$\left| \begin{array}{ccc} R & I & R \\ \hline R & & R \end{array} \right|$$
$$I - \frac{E}{R+R} I - \frac{—}{+} .$$

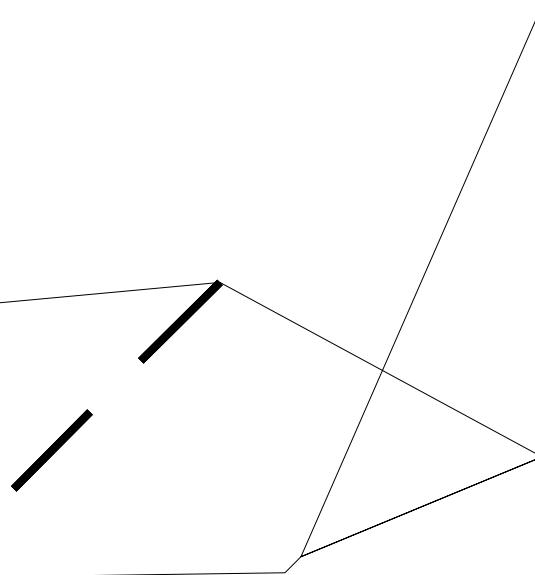
•

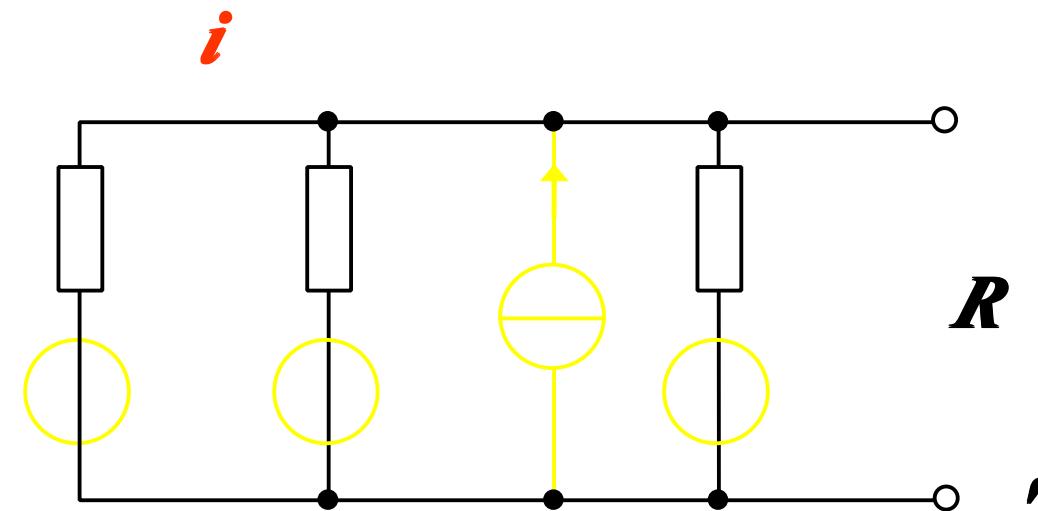
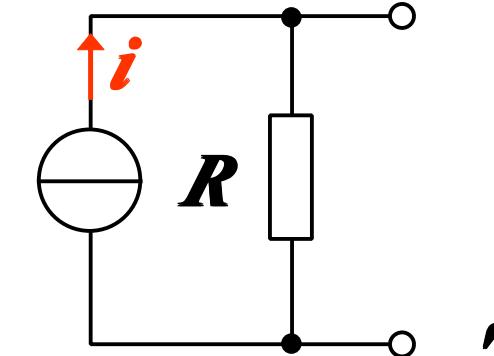
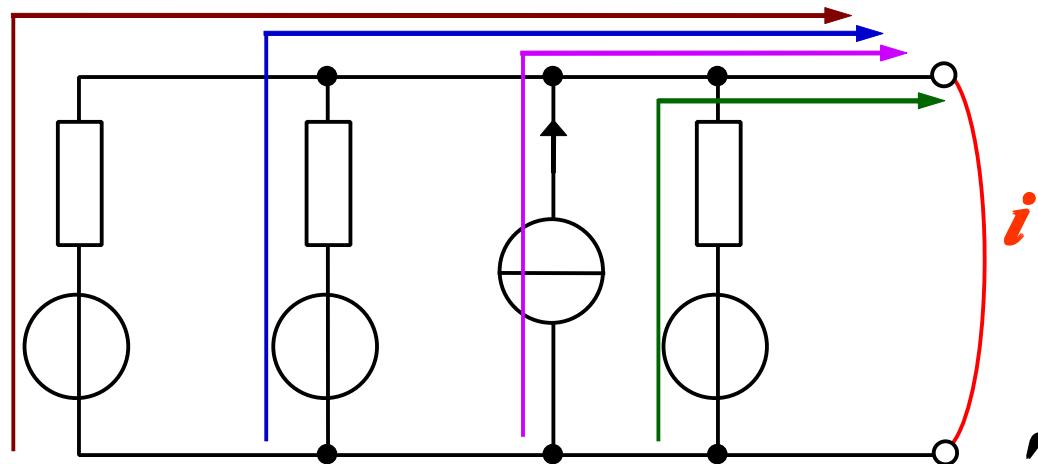


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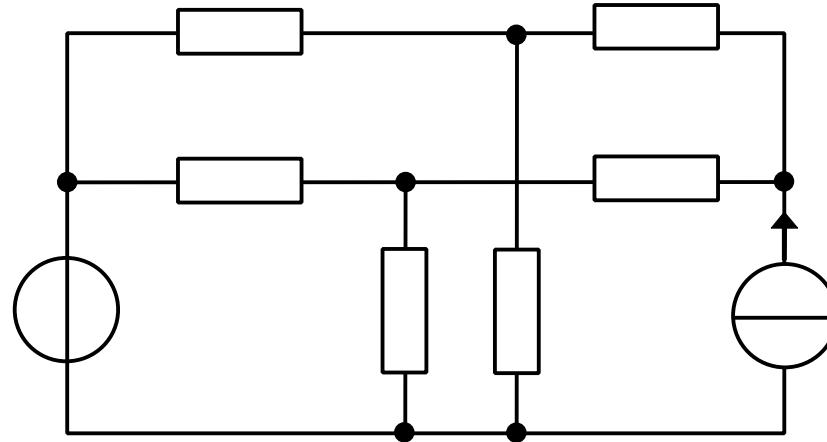
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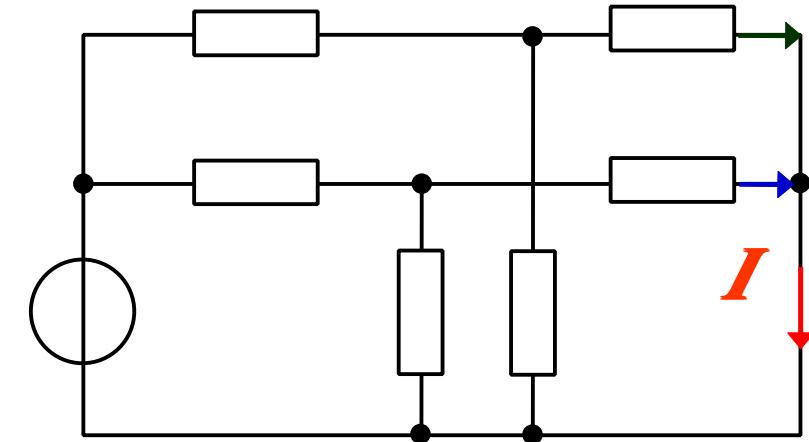




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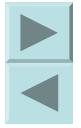
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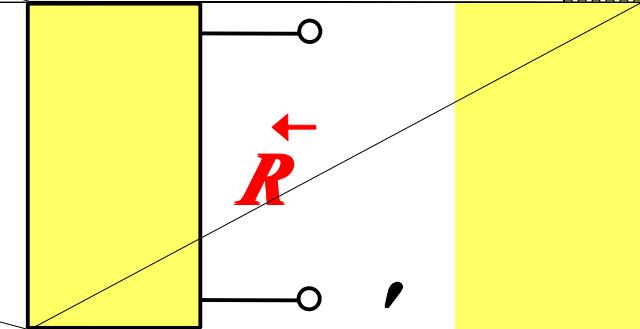
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**$R$**



**$R$**

