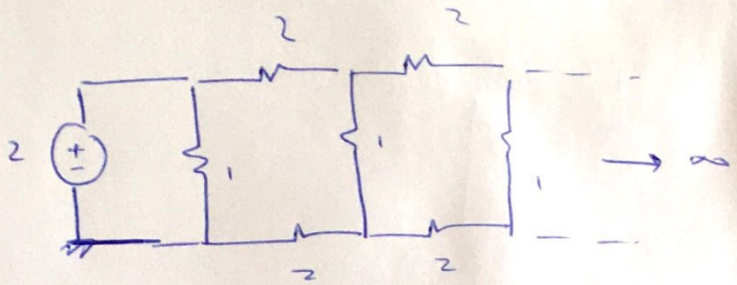
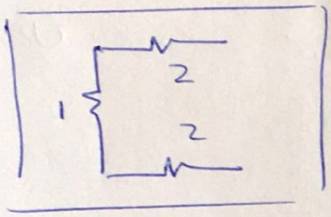
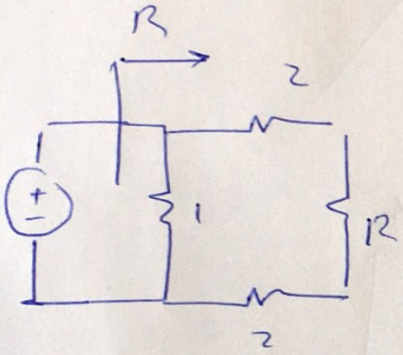
①

مثال) جریان نامدار زیر را حساب کنید





حل / مدار به سمت بی‌نهایت می‌رود. یعنی



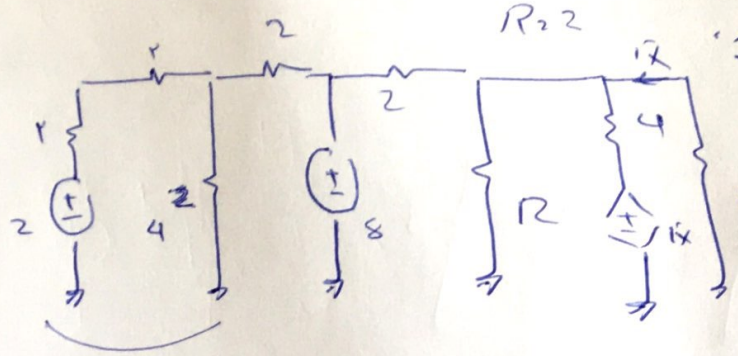
بی‌نهایت بار تکرار می‌شود. پس

$$R = 1 \parallel (R+2+2) \Rightarrow R = 1 \parallel (R+4) = \frac{R+4}{R+5}$$

$$R^2+5R = R+4 \rightarrow R^2+4R-4 = 0$$

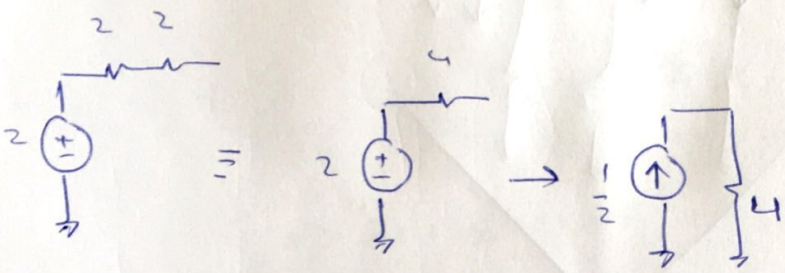
$$R = -2 \pm 2\sqrt{2} \Rightarrow \boxed{R = -2+2\sqrt{2}}$$

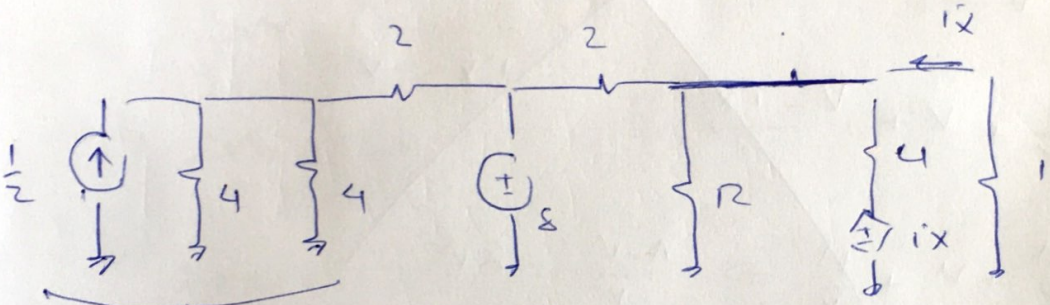
۳) توانِ مقاومتِ R را بدست آورید.

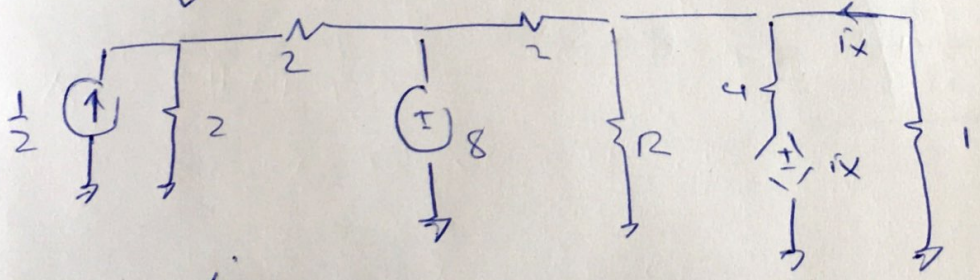


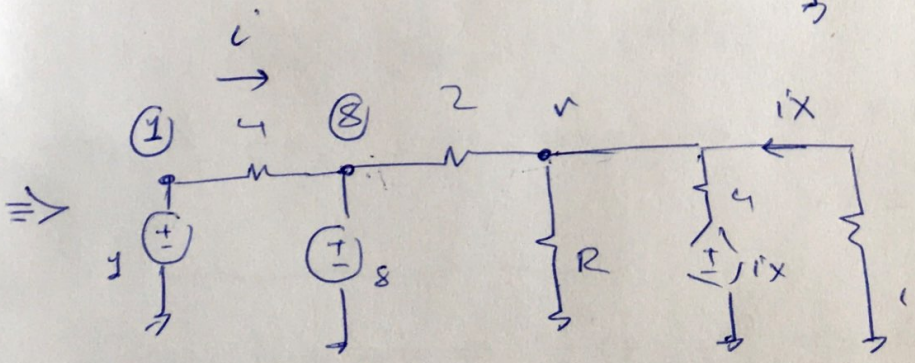
روش اول ← kvl , kcl

روش دوم ← تبدیل منابع









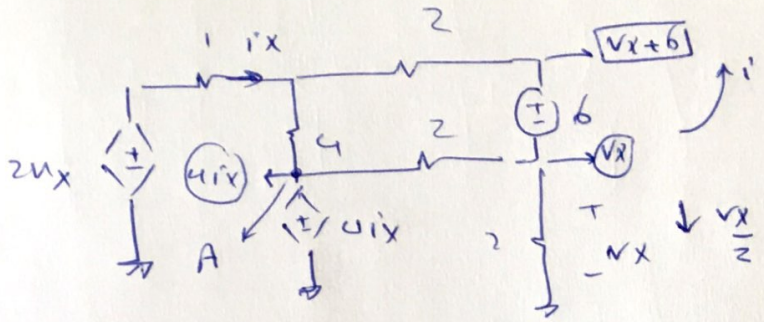
$i = -7/4$ (?)

$i_x = -v$

$$\frac{8-v}{2} = \frac{v}{2} + v + \frac{v-(-v)}{4} \Rightarrow \frac{8-v}{2} = \frac{v}{2} + v + \frac{v}{2} = 2v$$

$$8 - v = 4v \rightarrow 8 = 5v \rightarrow v = 8/5 \rightarrow P = \frac{S^2}{R} = \frac{(8/5)^2}{2}$$

مثال: مدار شکل زیر را تحلیل کنید ← اصل سوال ← گره



$$\text{kcl @ } v_x: \quad \frac{4i_x - v_x}{2} = \frac{v_x}{2} + i$$

$$\Rightarrow 2i_x = v_x + i \rightarrow \boxed{i = 2i_x - v_x}$$

$$\text{kvl}: \quad 2v_x = i_x + 2(-i) + 6 + v_x$$

$$2v_x = i_x + 2(v_x - 2i_x) + 6 + v_x$$

$$2v_x = i_x + 2v_x - 4i_x + 6 + v_x$$

$$2v_x = 3v_x - 3i_x + 6 \rightarrow \boxed{v_x = 3i_x - 6}$$

$$2v_x = i_x + 4(3i_x - v_x) + 4i_x$$

$$2v_x = 5i_x + 12i_x - 4v_x \Rightarrow 6v_x = 17i_x$$

$$\boxed{v_x = \frac{17}{6} i_x}$$

$$\frac{17}{6} i_x = 3i_x - 6 \Rightarrow -\frac{1}{6} i_x = -6 \Rightarrow \boxed{i_x = 36}$$

$$i = 2(36) - \left(\frac{17}{6} * 36\right) = 72 - 102^{4} = \boxed{-50\ A}$$