

PRAYAS

JEE 2025

ATDB.uno

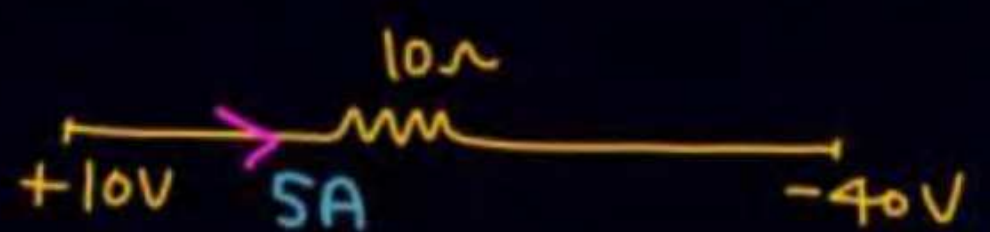
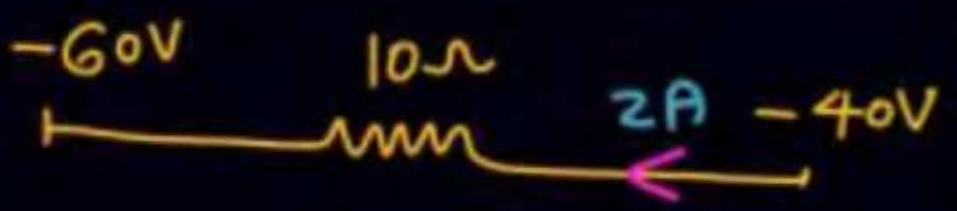
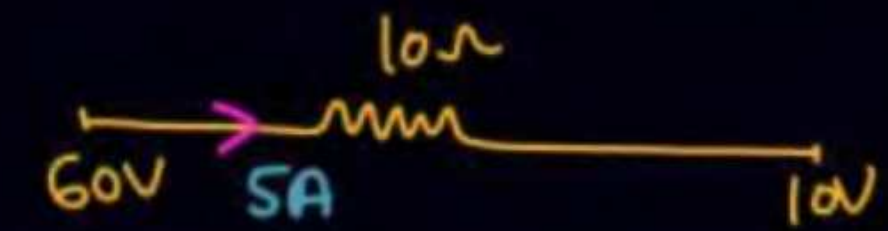
Lecture - Physics

Current Electricity

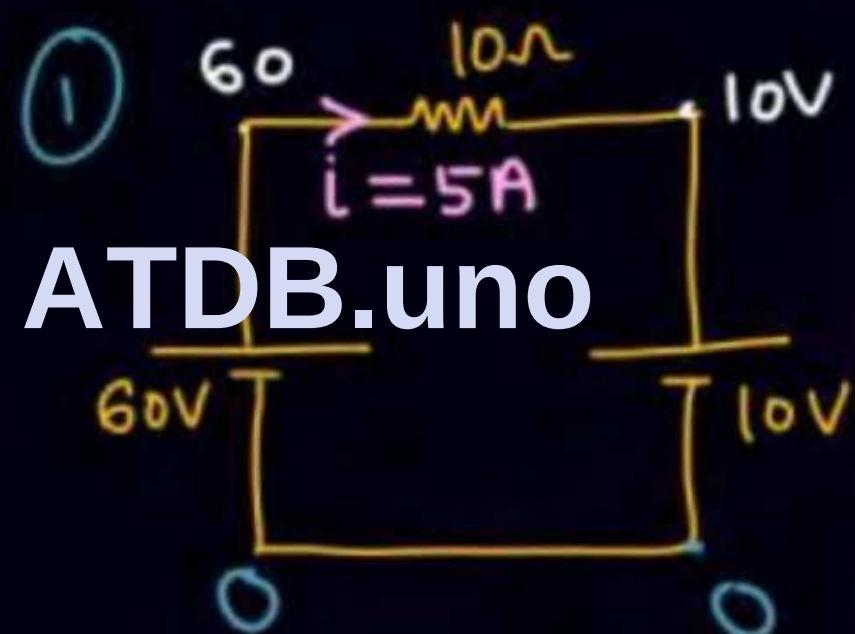
(Home Work Discussion)
70-72 Ques.

By- Saleem Ahmed Sir

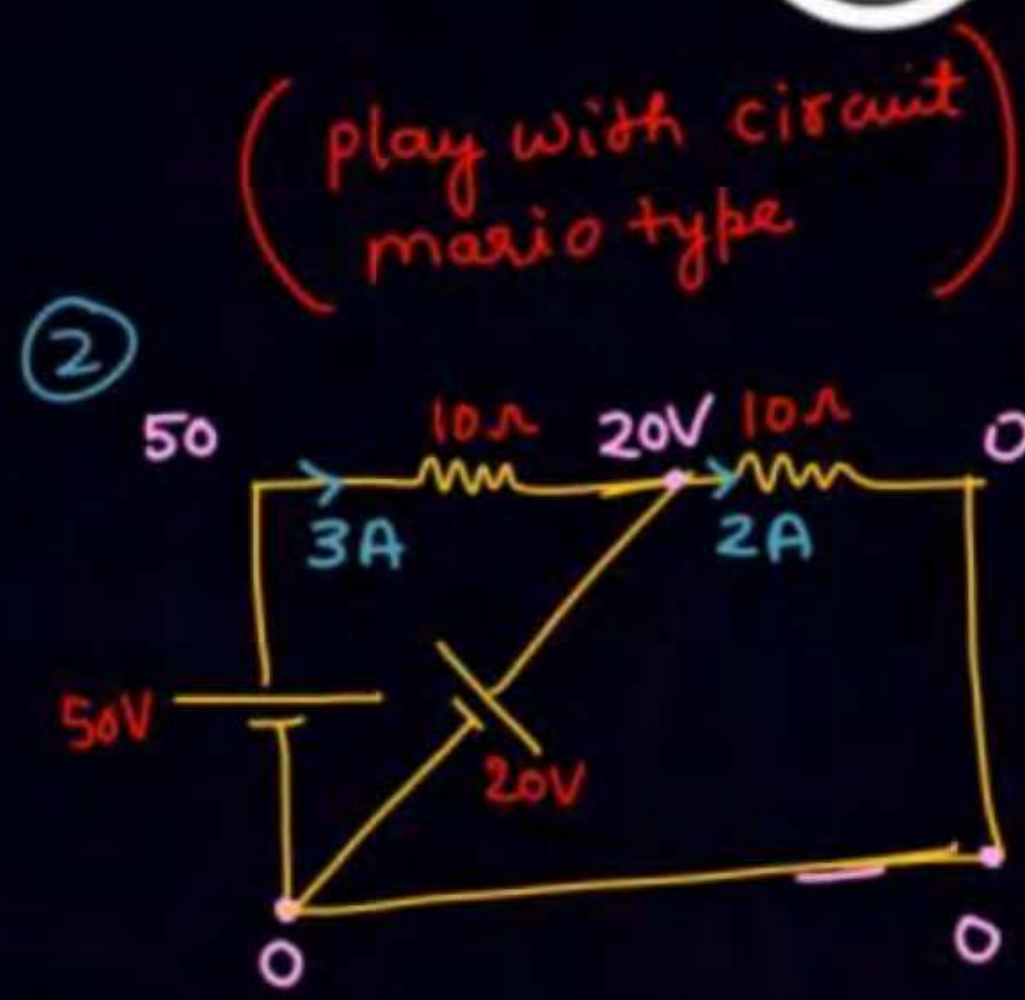


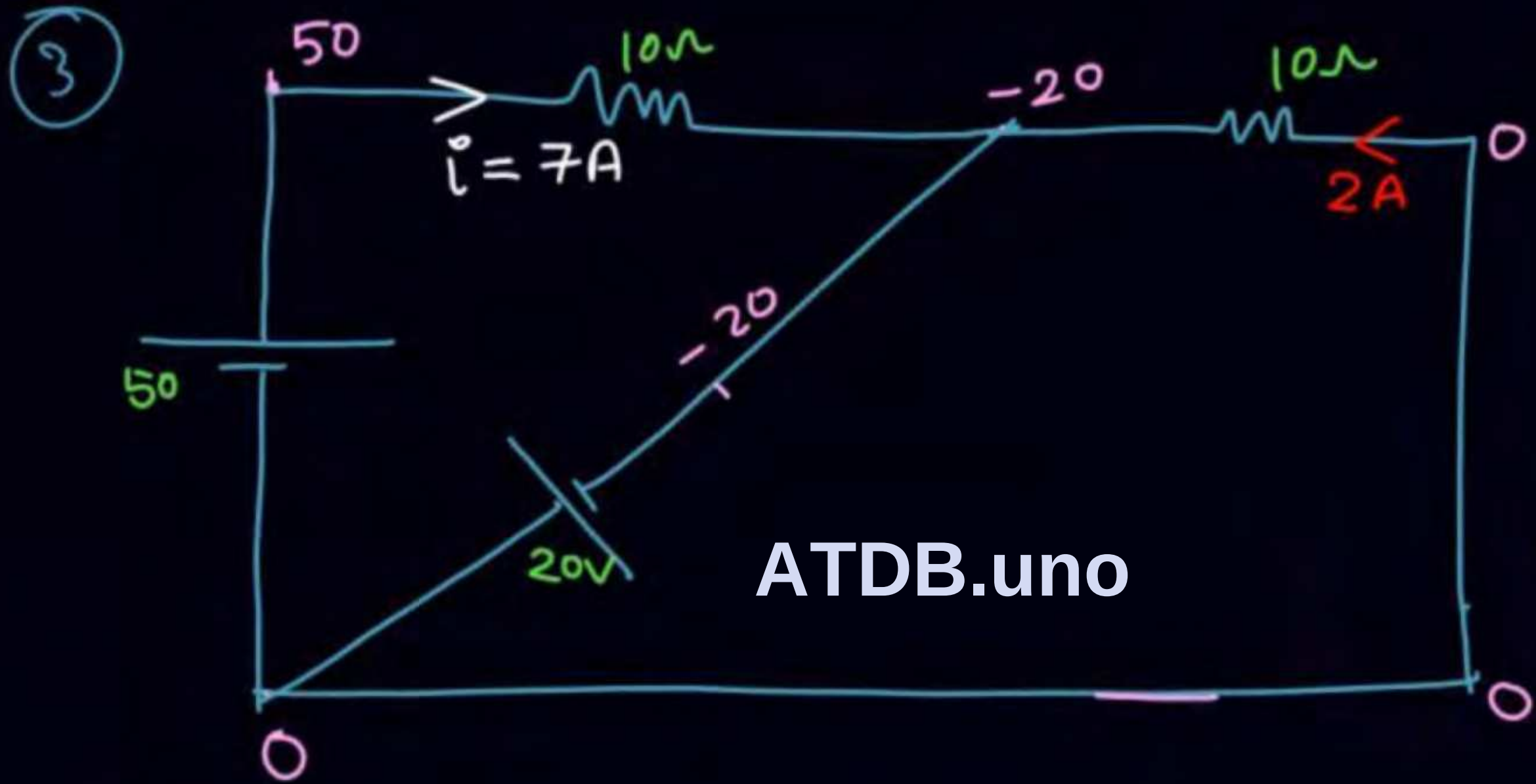


$$-30 - (-50) = 20$$

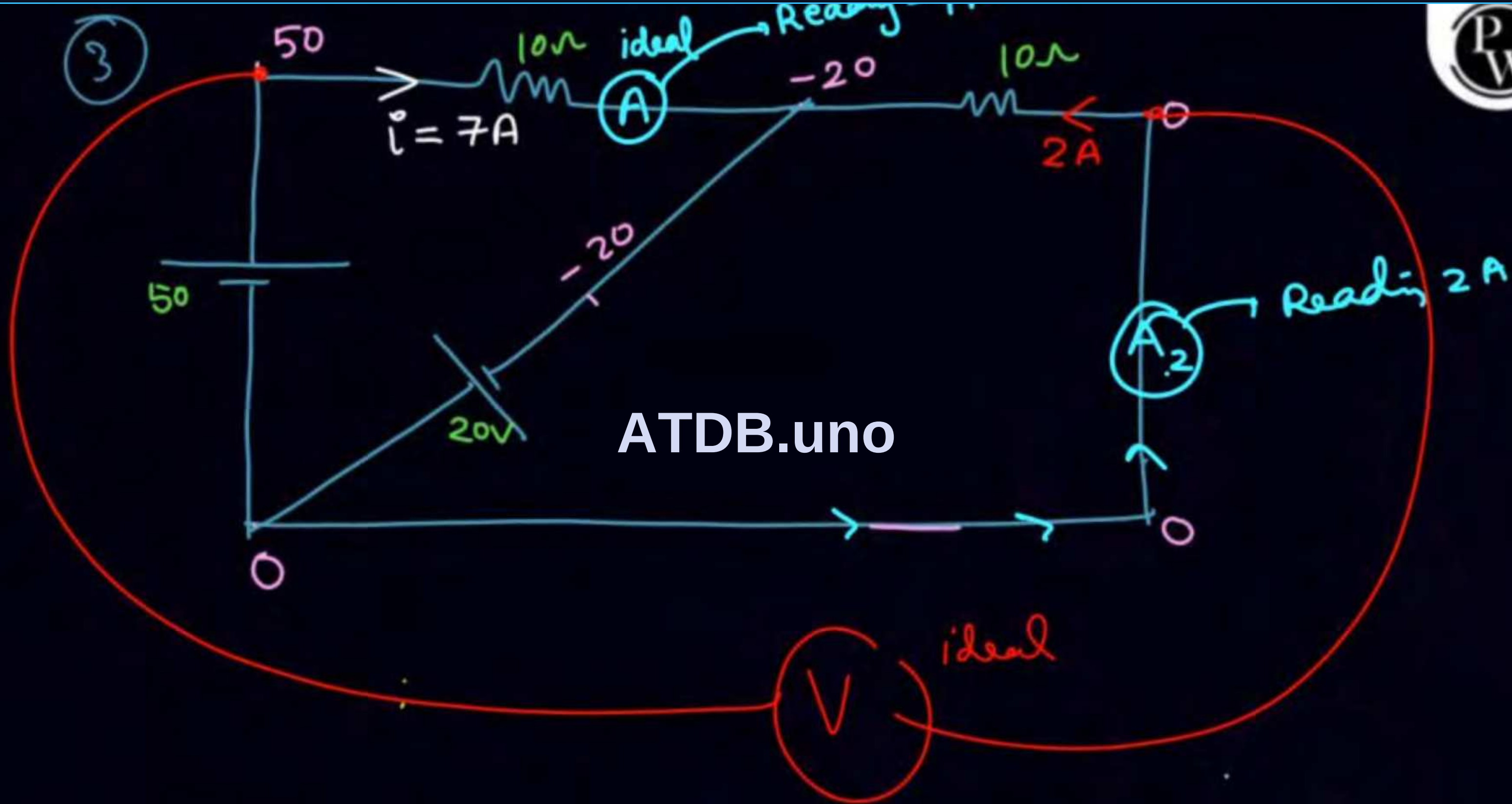


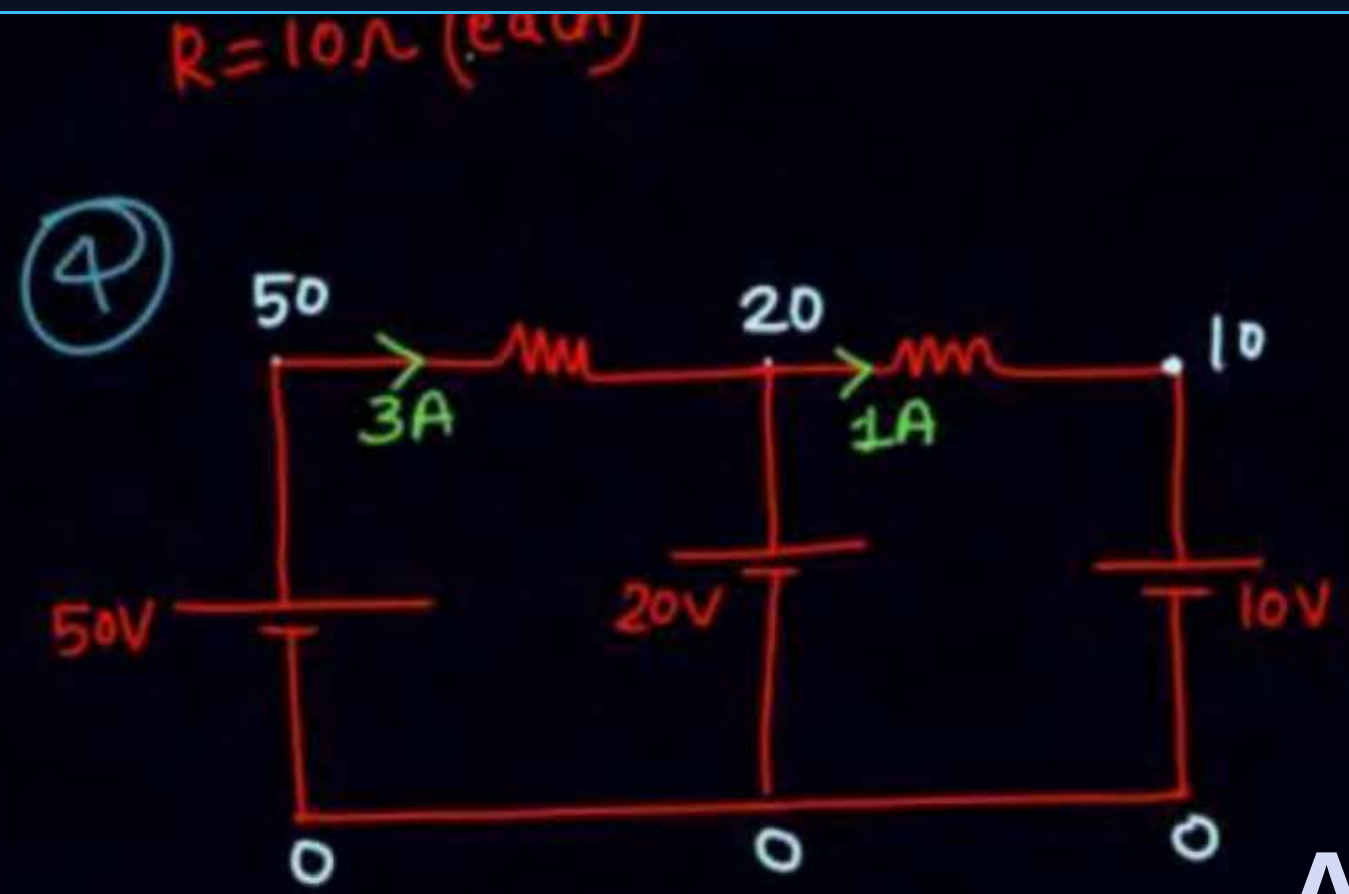
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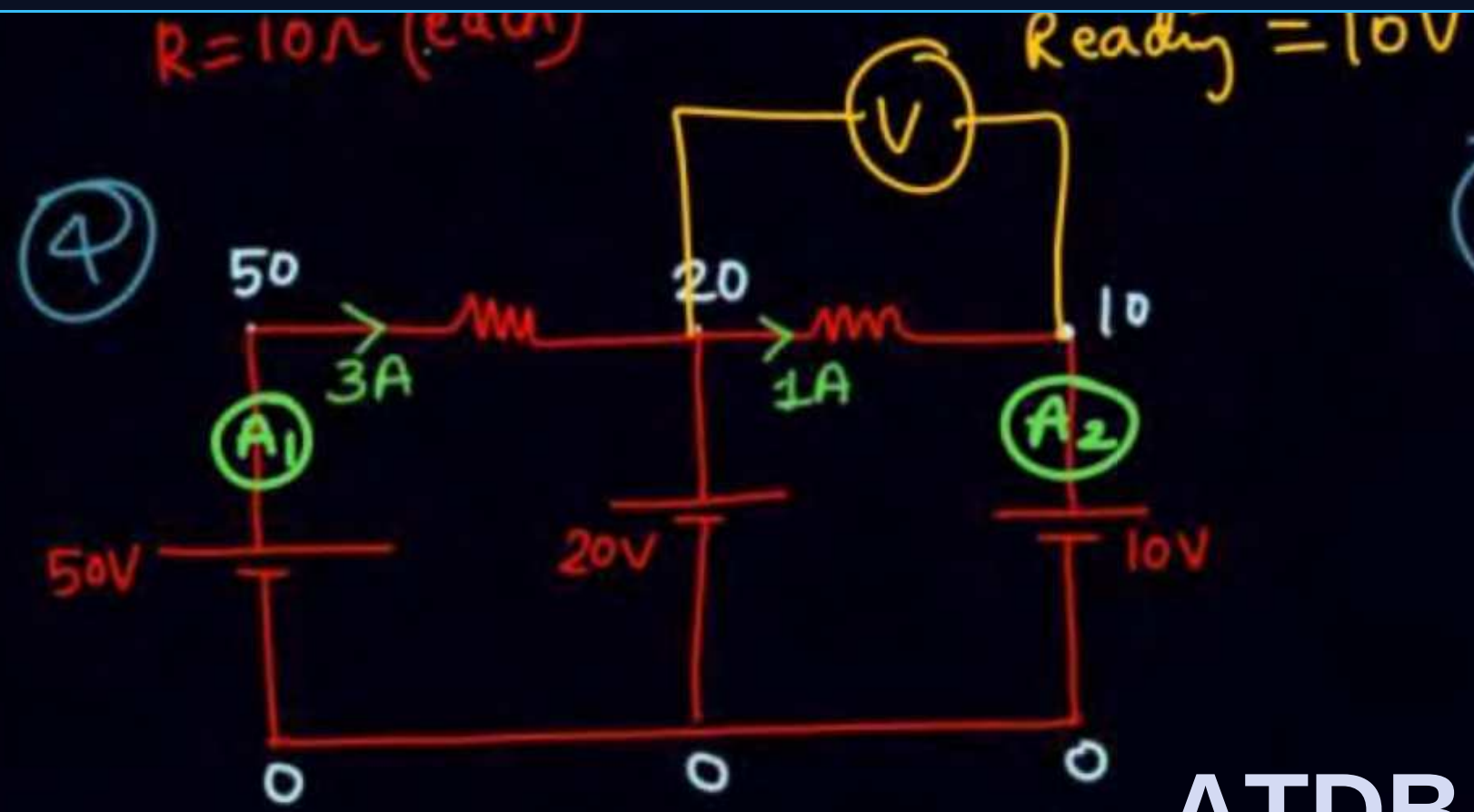


⑤

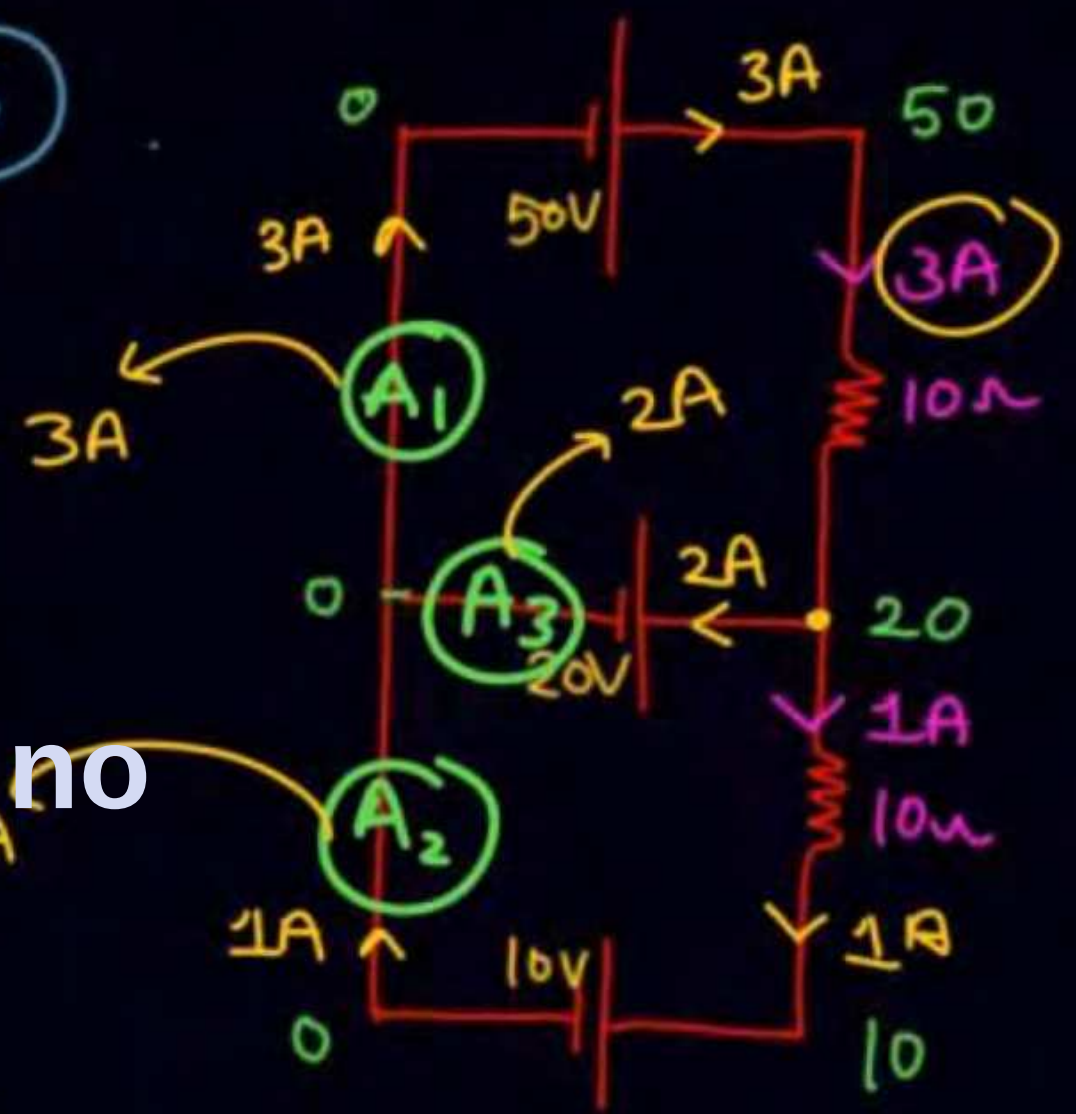


रटना कुछ
भी नहीं है
just play

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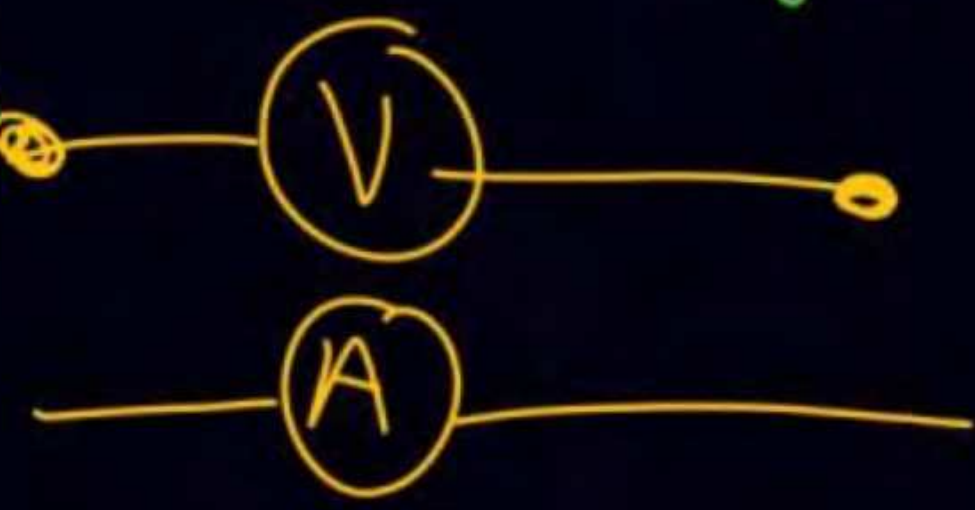


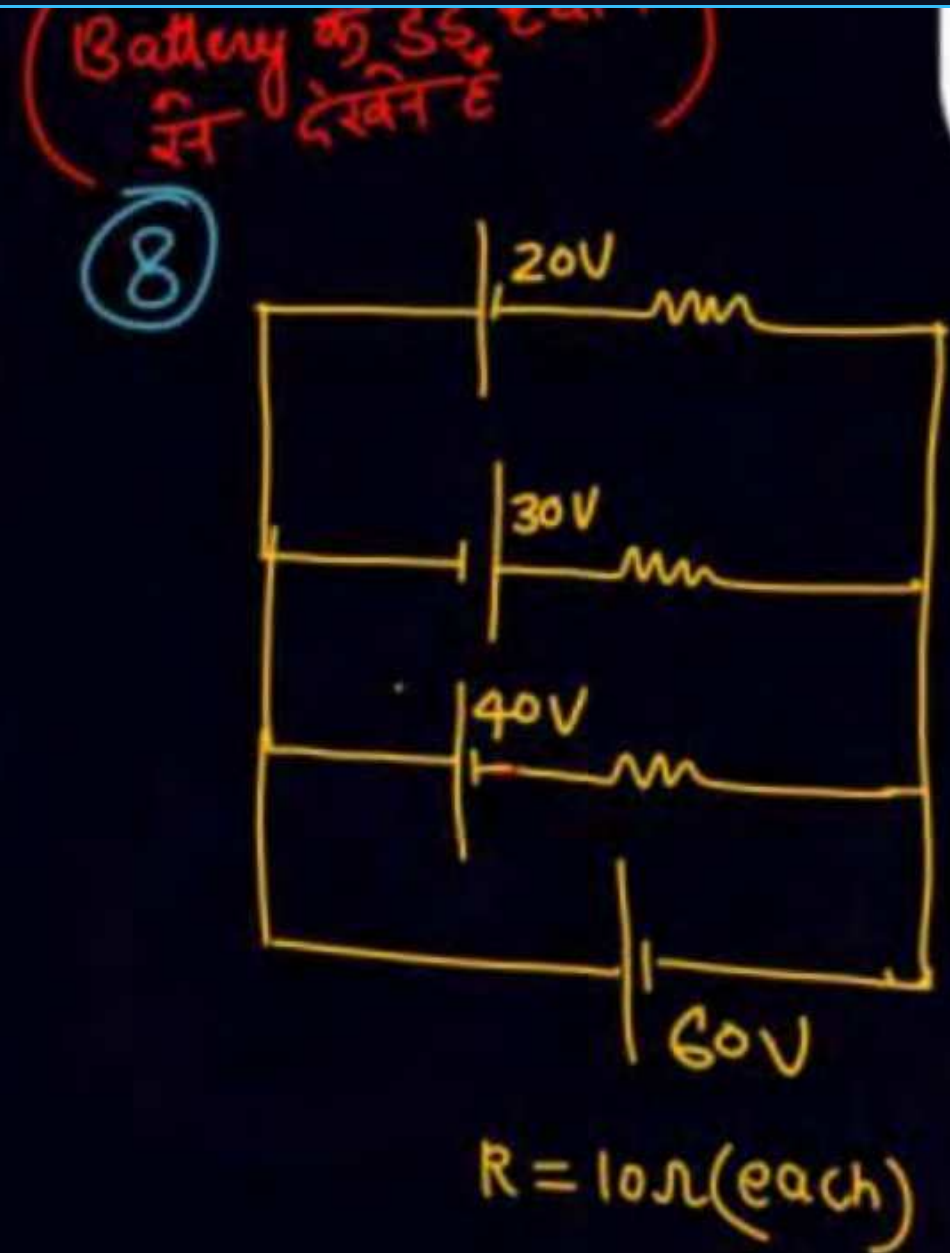
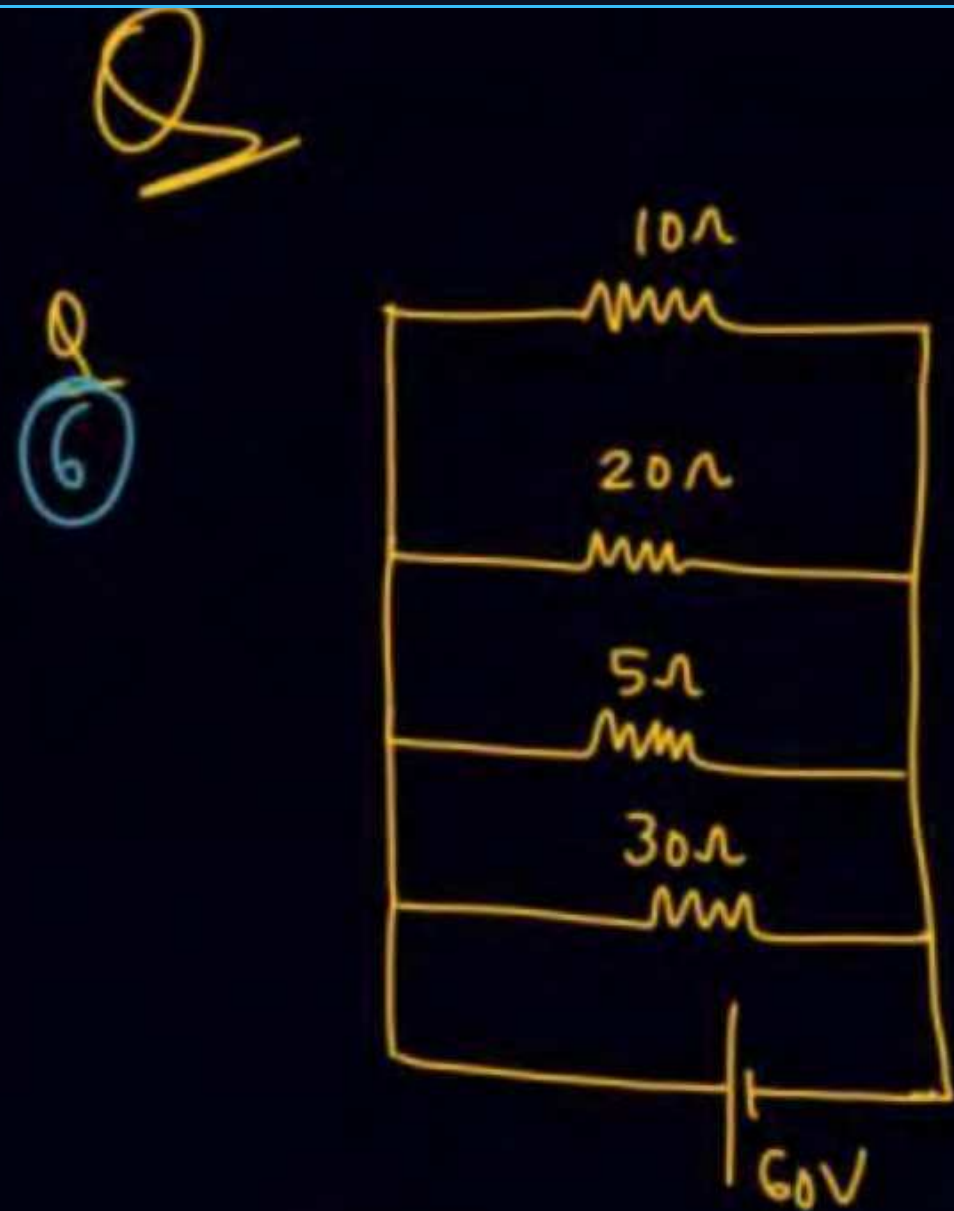
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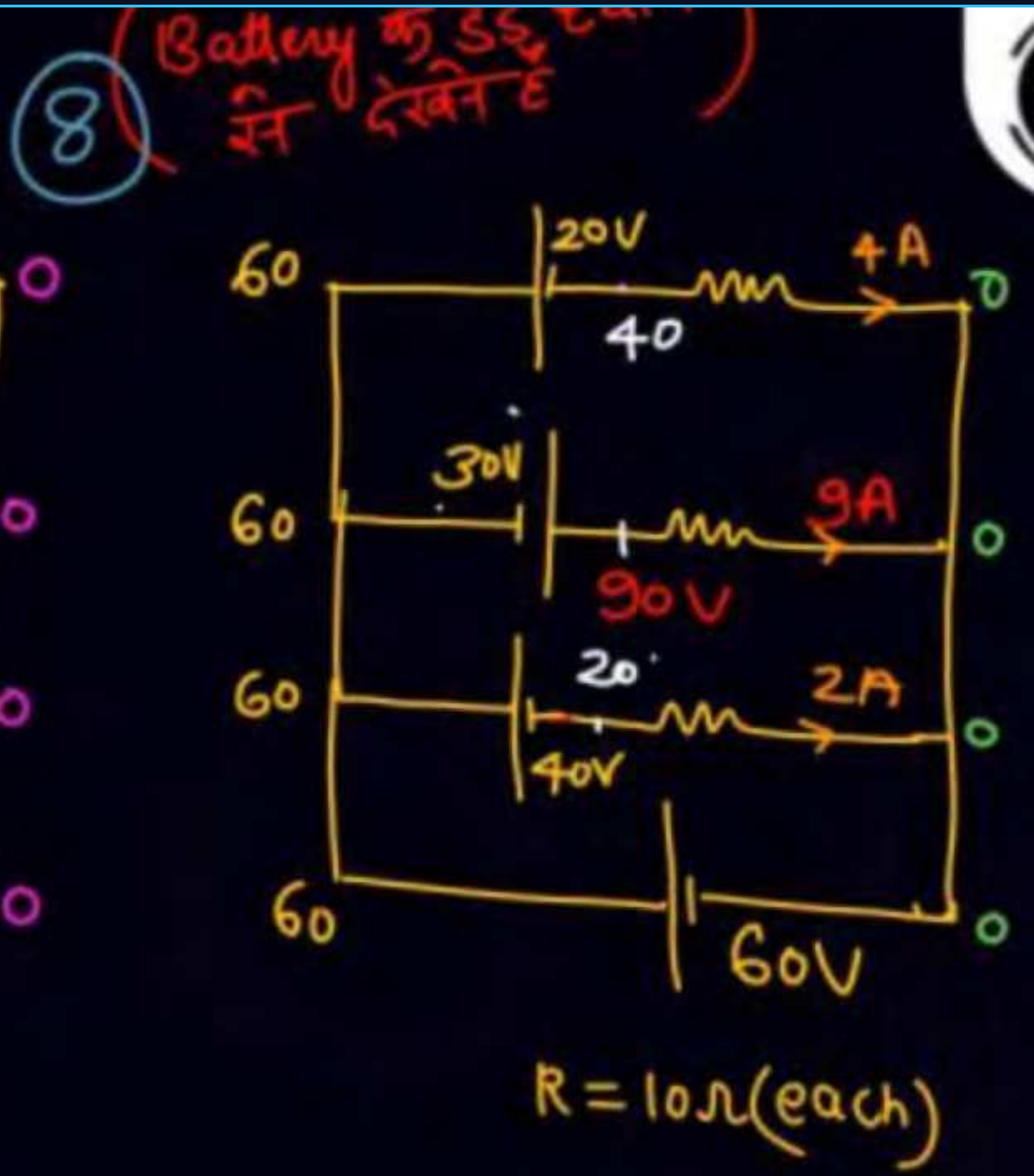
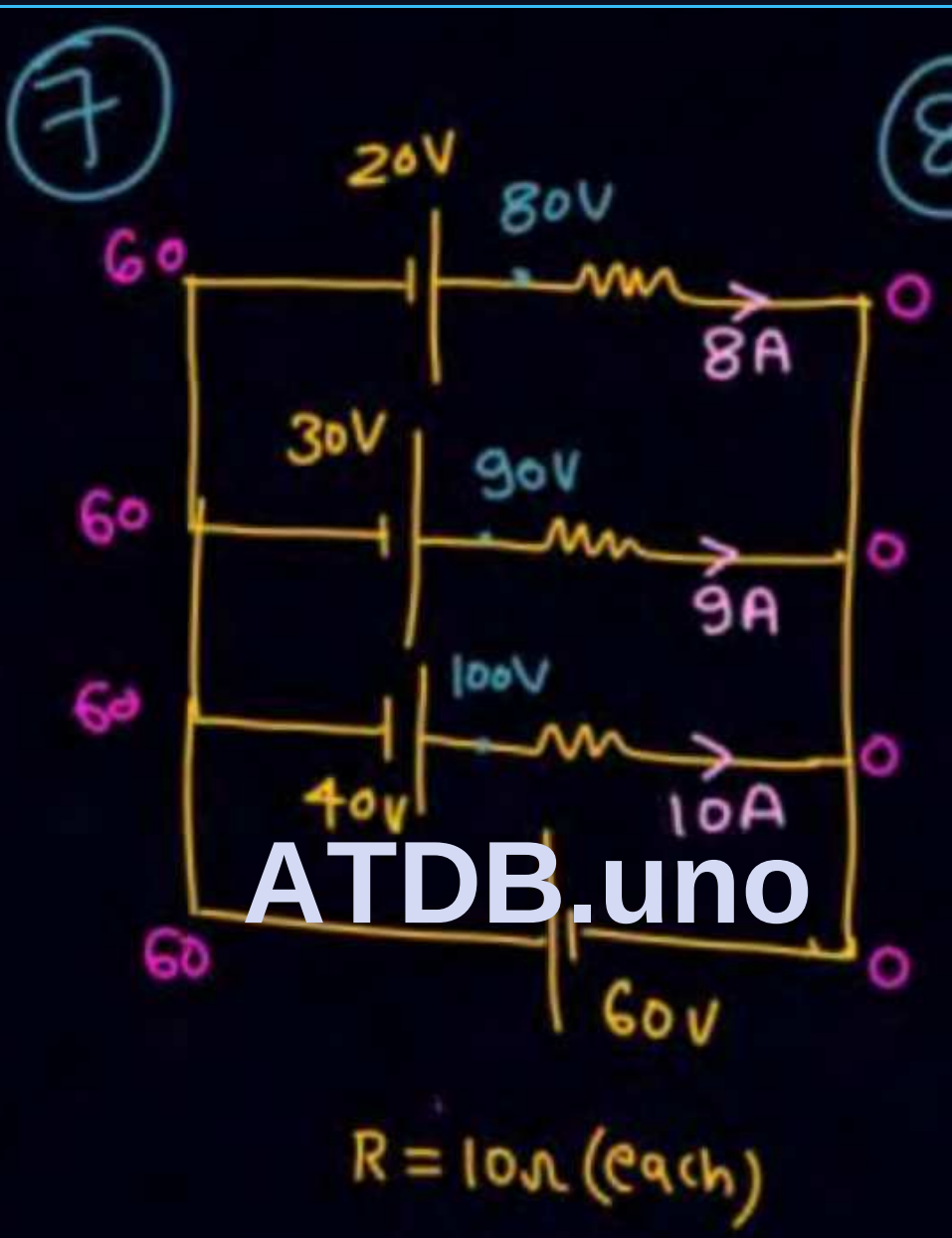
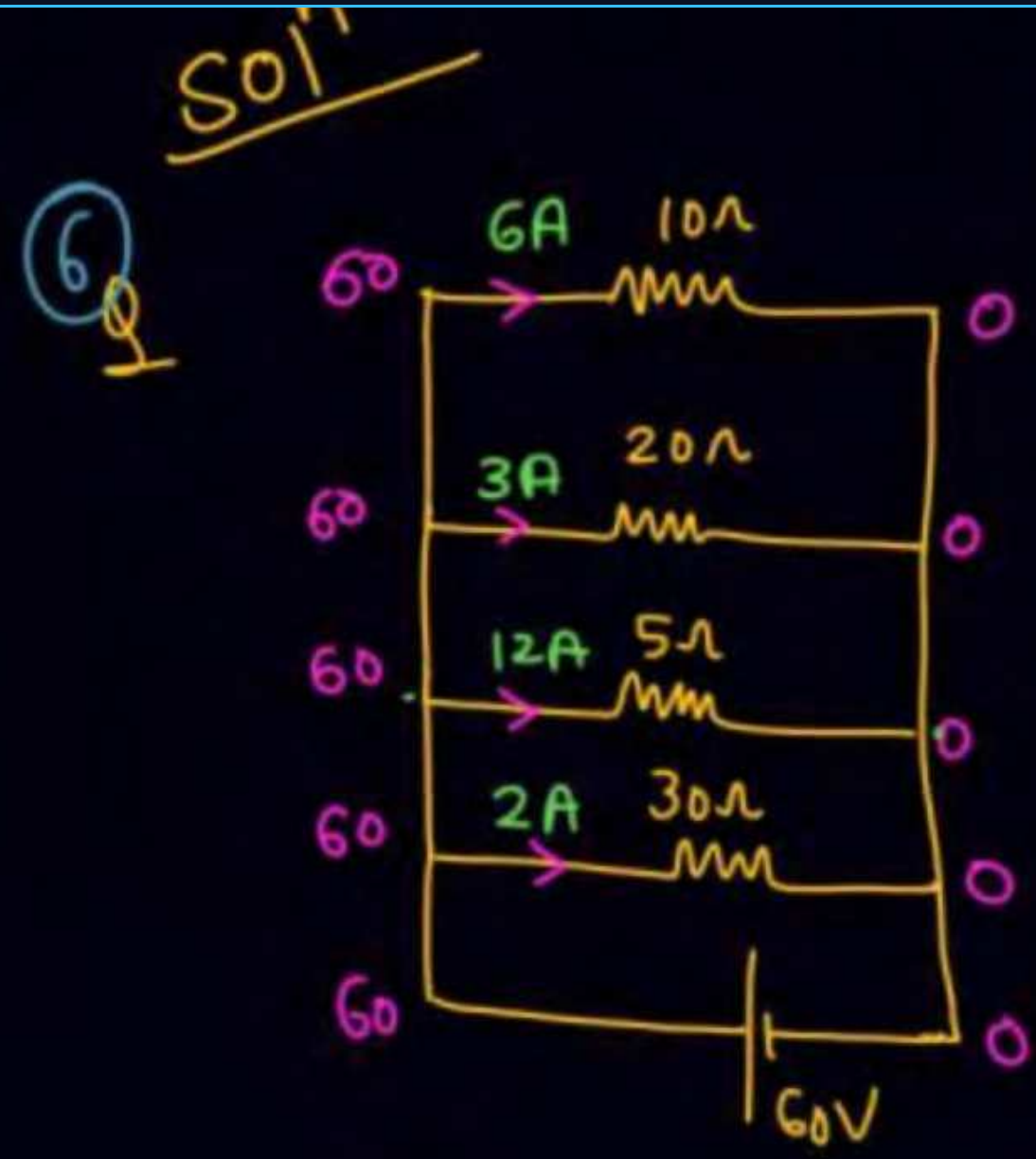


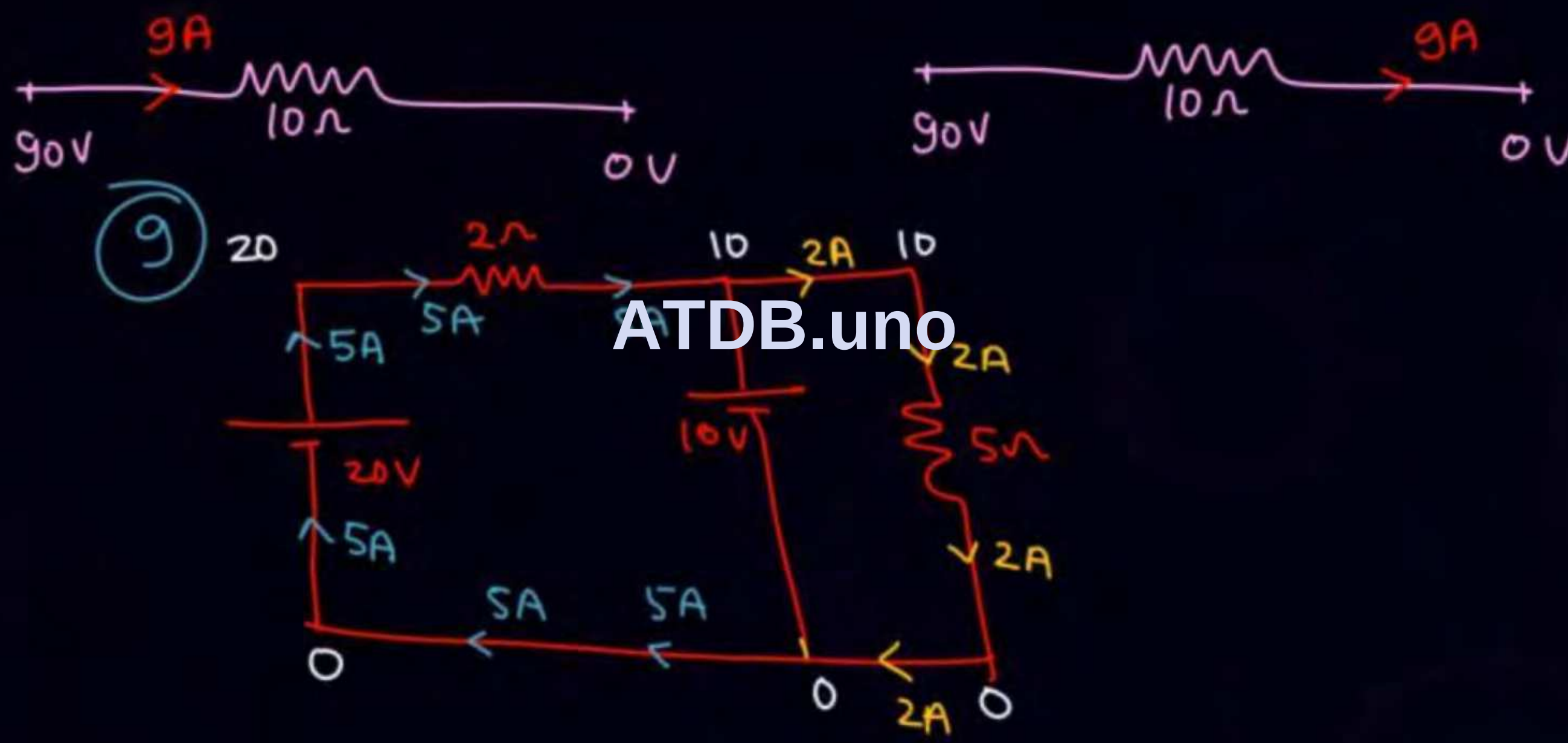
रटना कुछ
भी नहीं है
just play

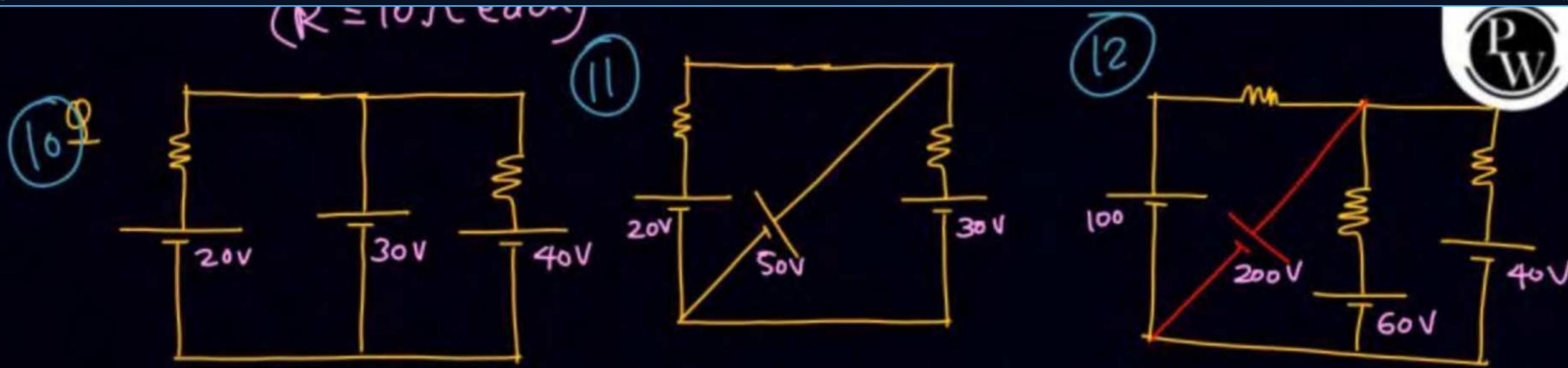
(A_1) Read $\rightarrow 3A$
 A_2 " $\rightarrow 1A$



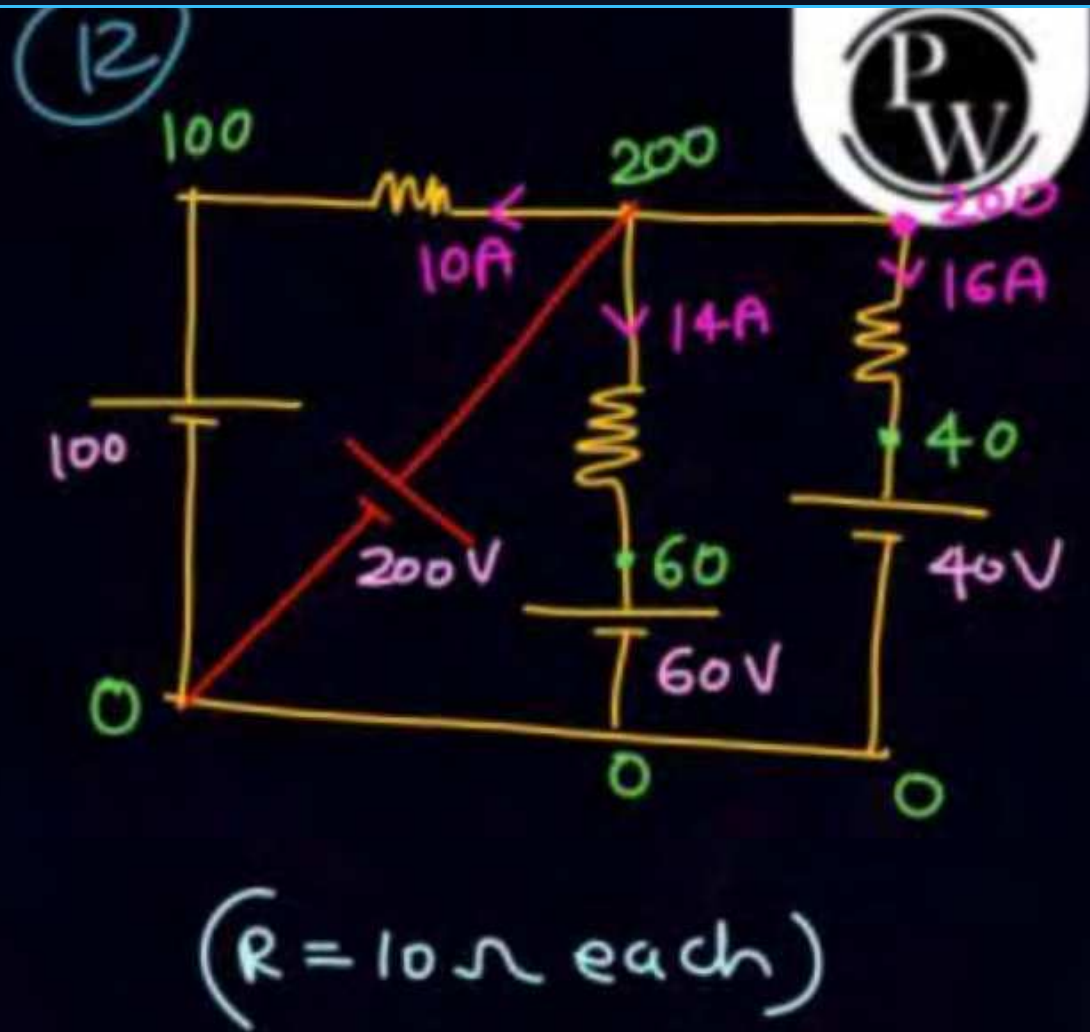
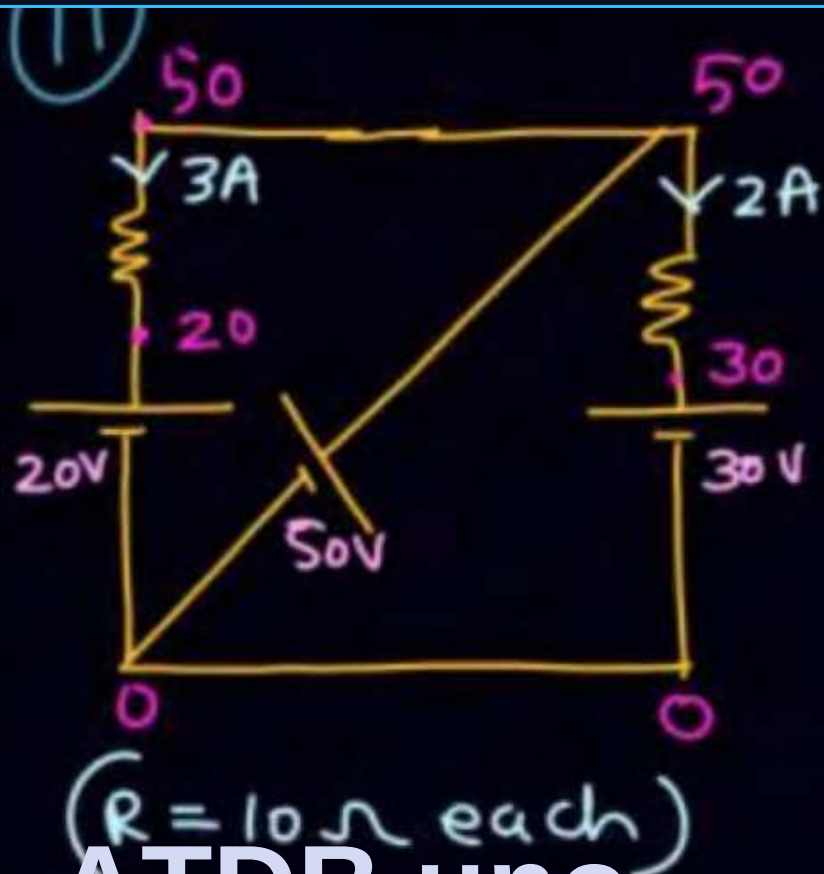
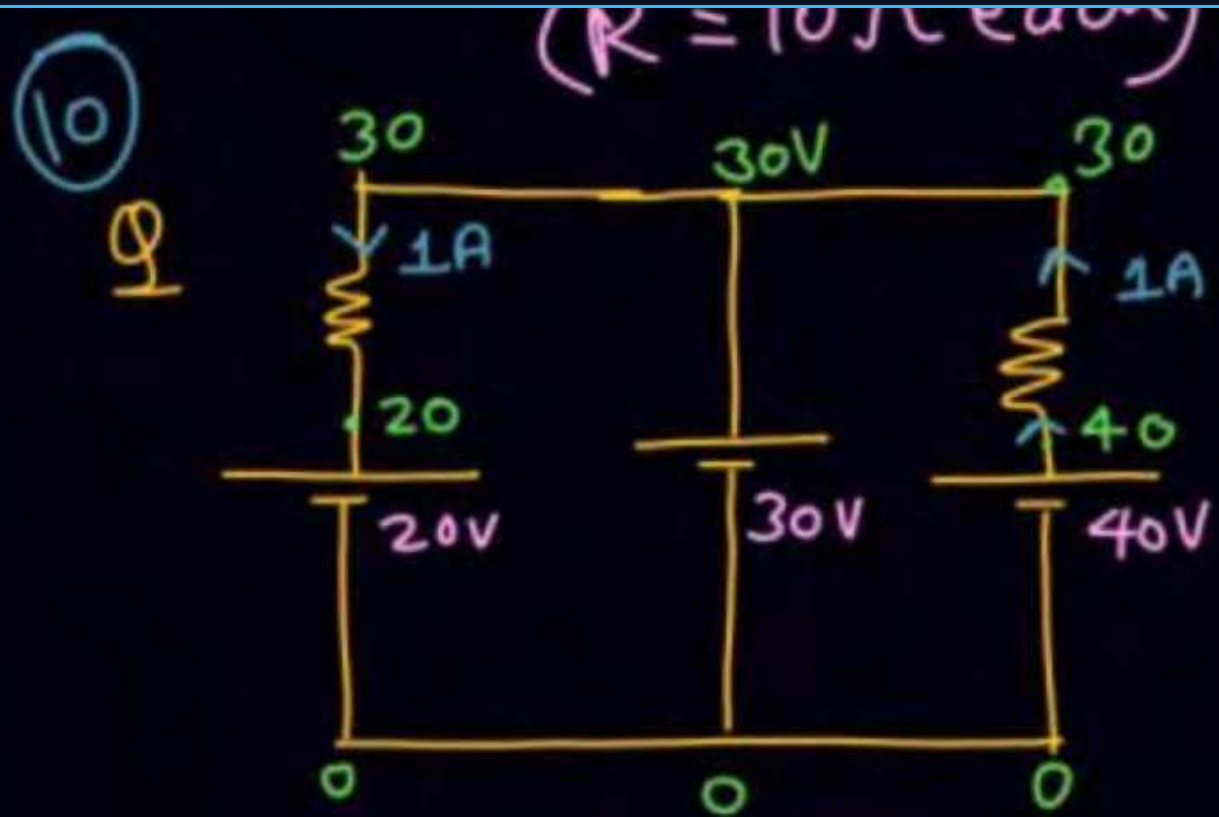




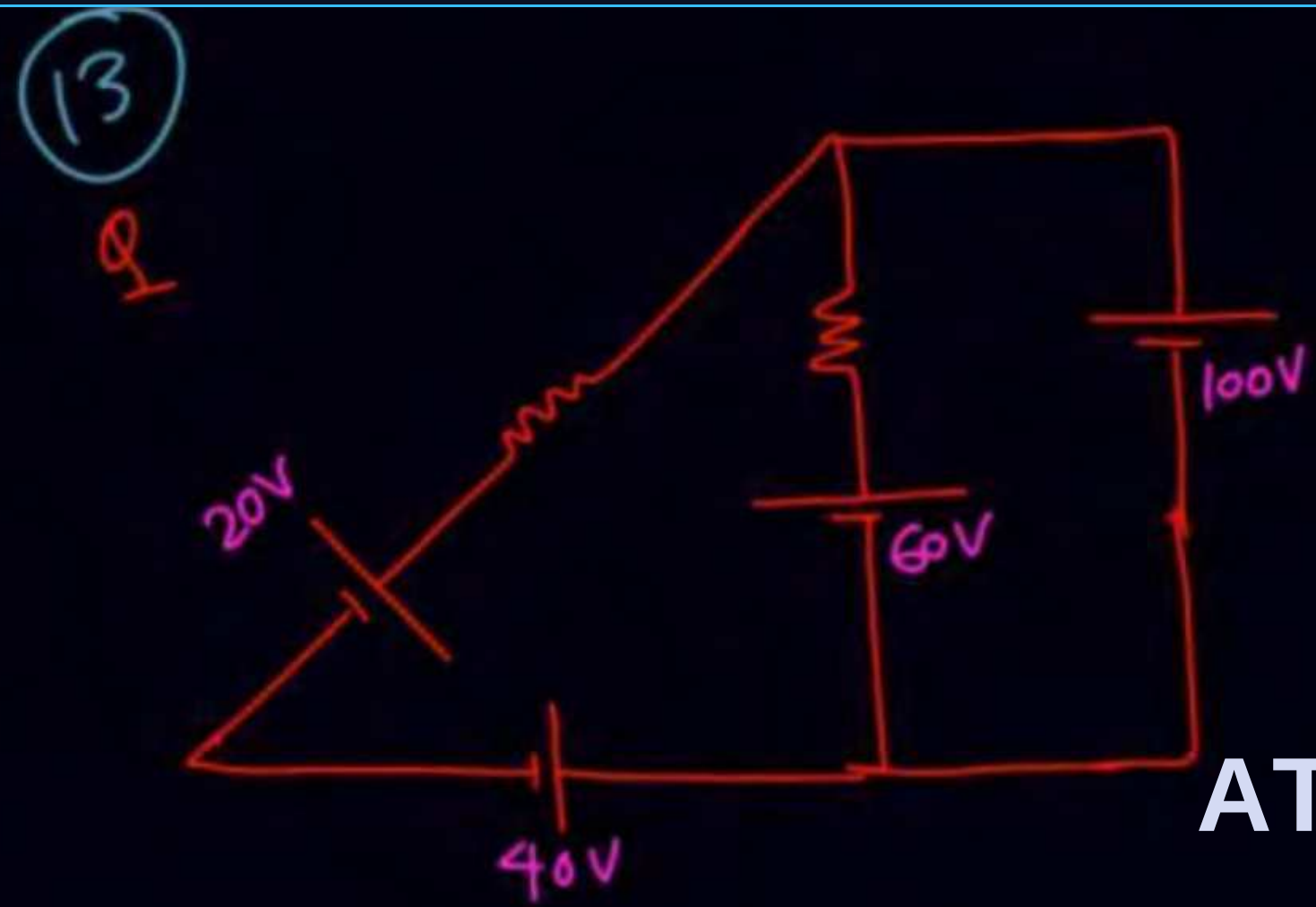




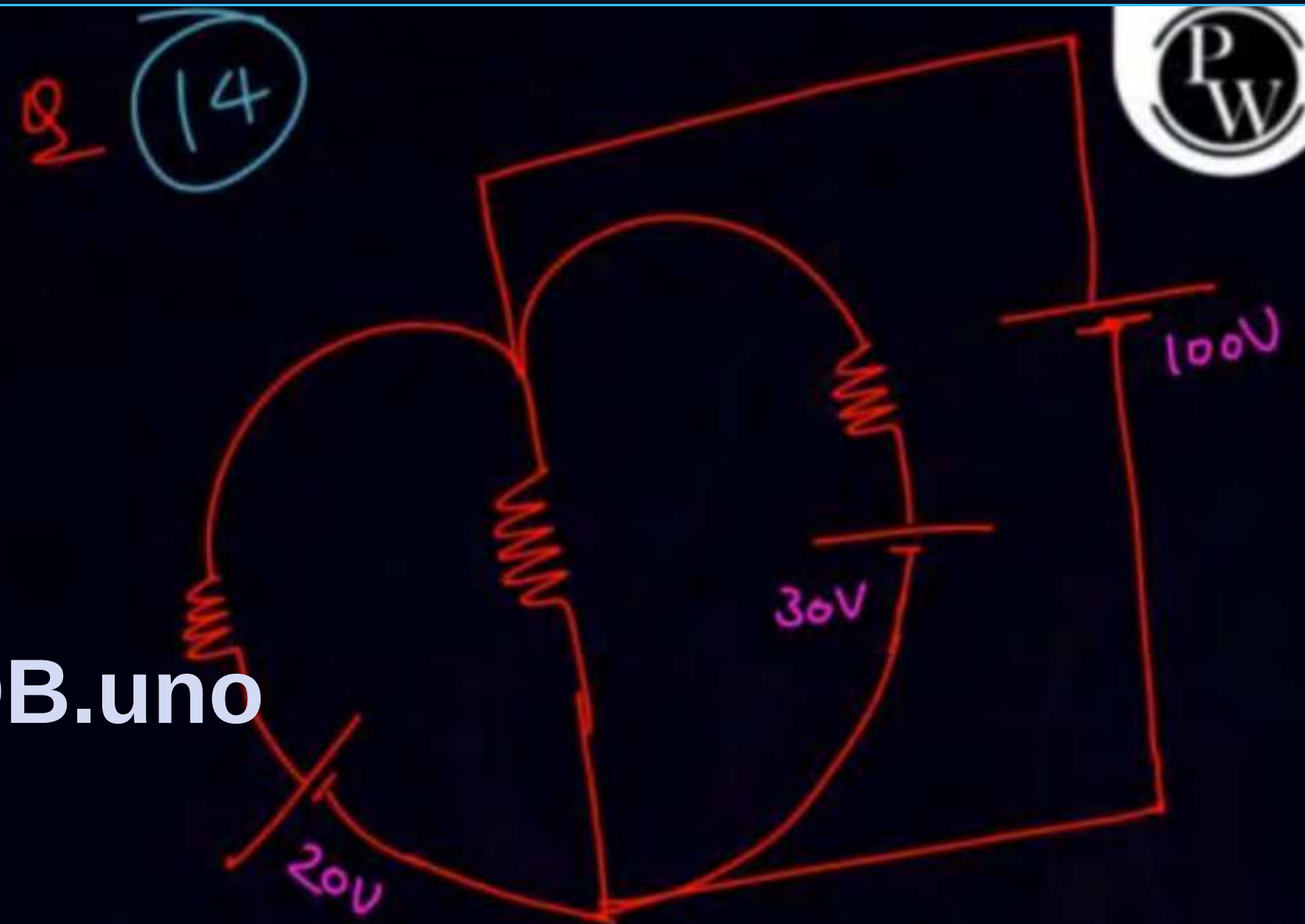
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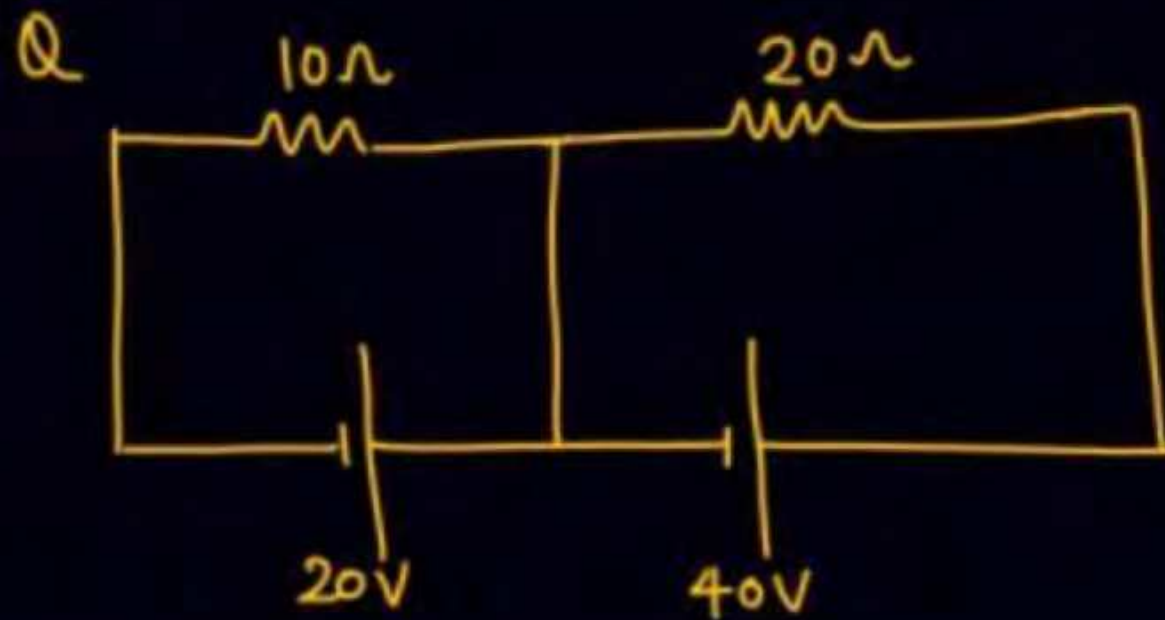
$R = 10\ \Omega$ (each)



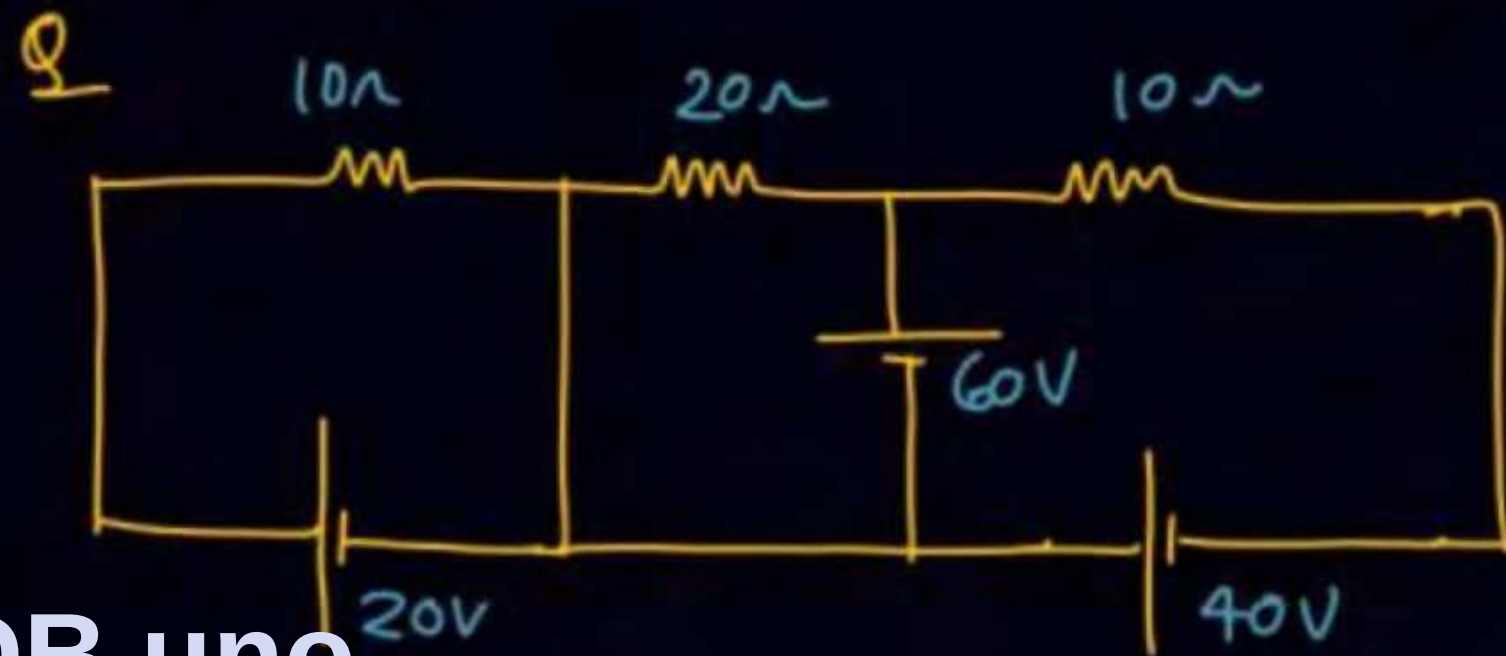
$R = 10\ \Omega$ (each)


$$R = 10 \Omega (\text{each})$$
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15

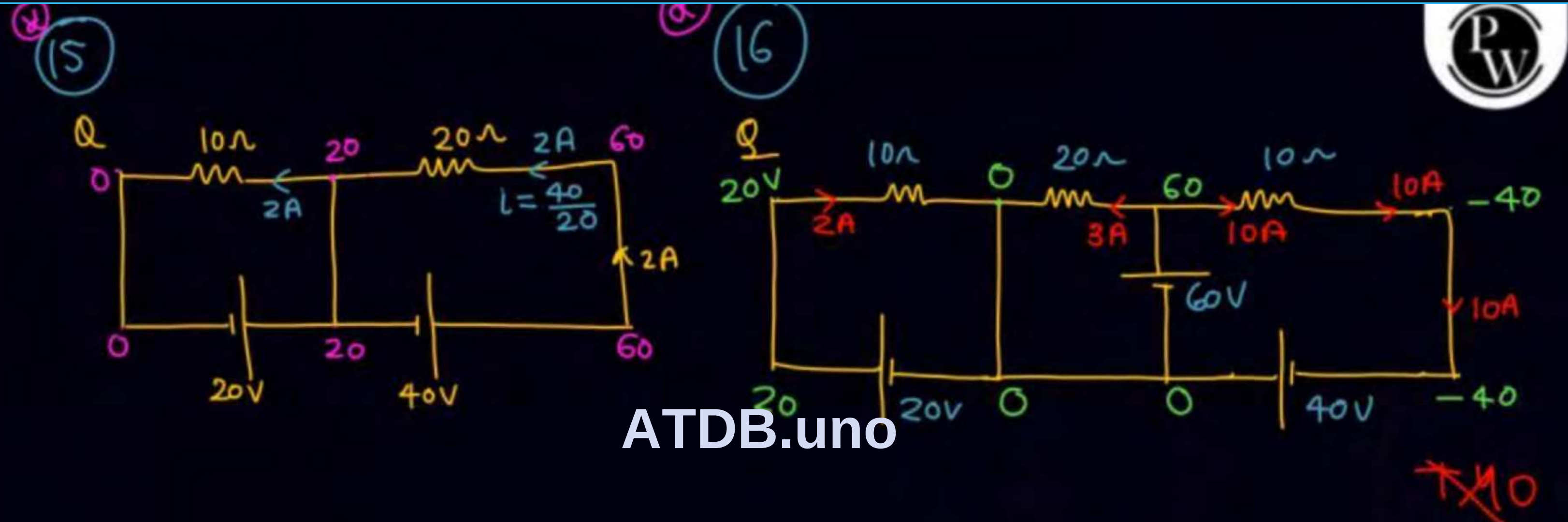


16

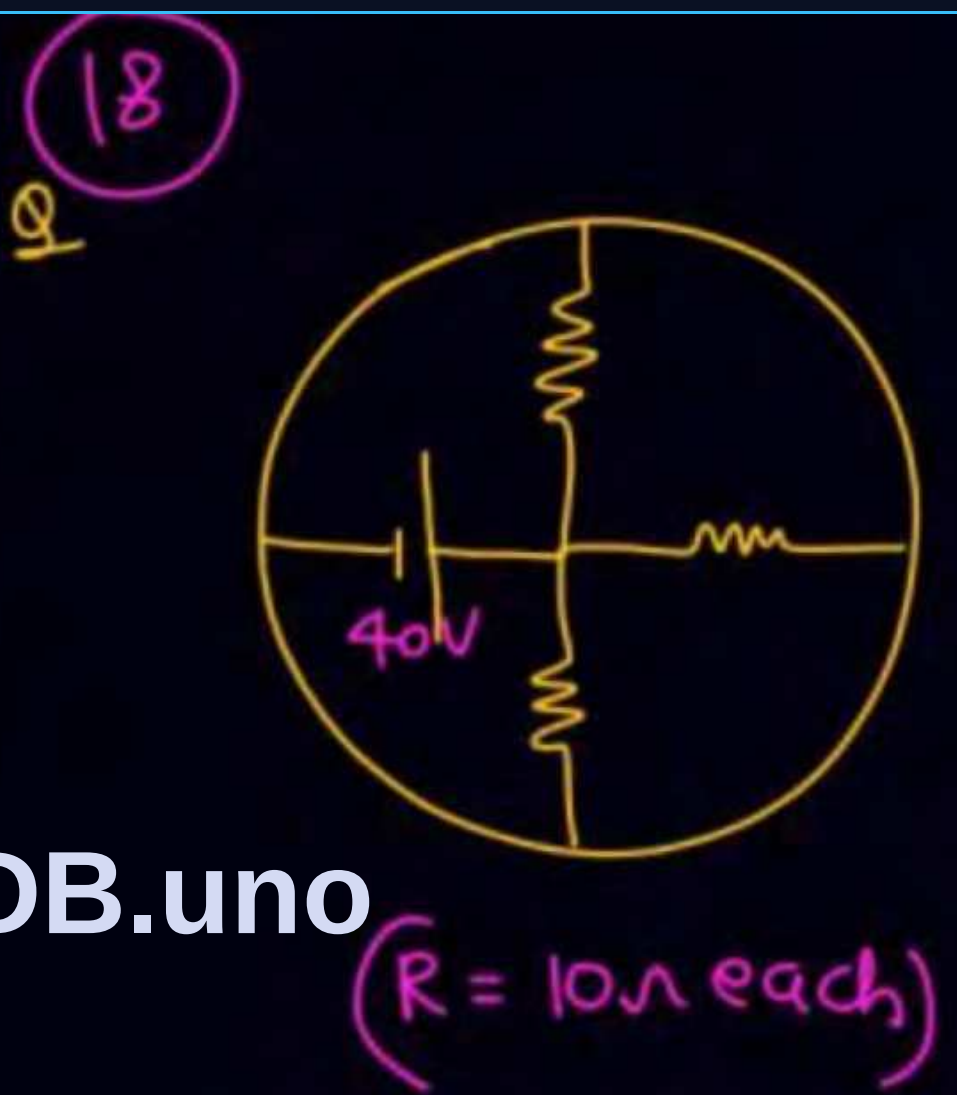
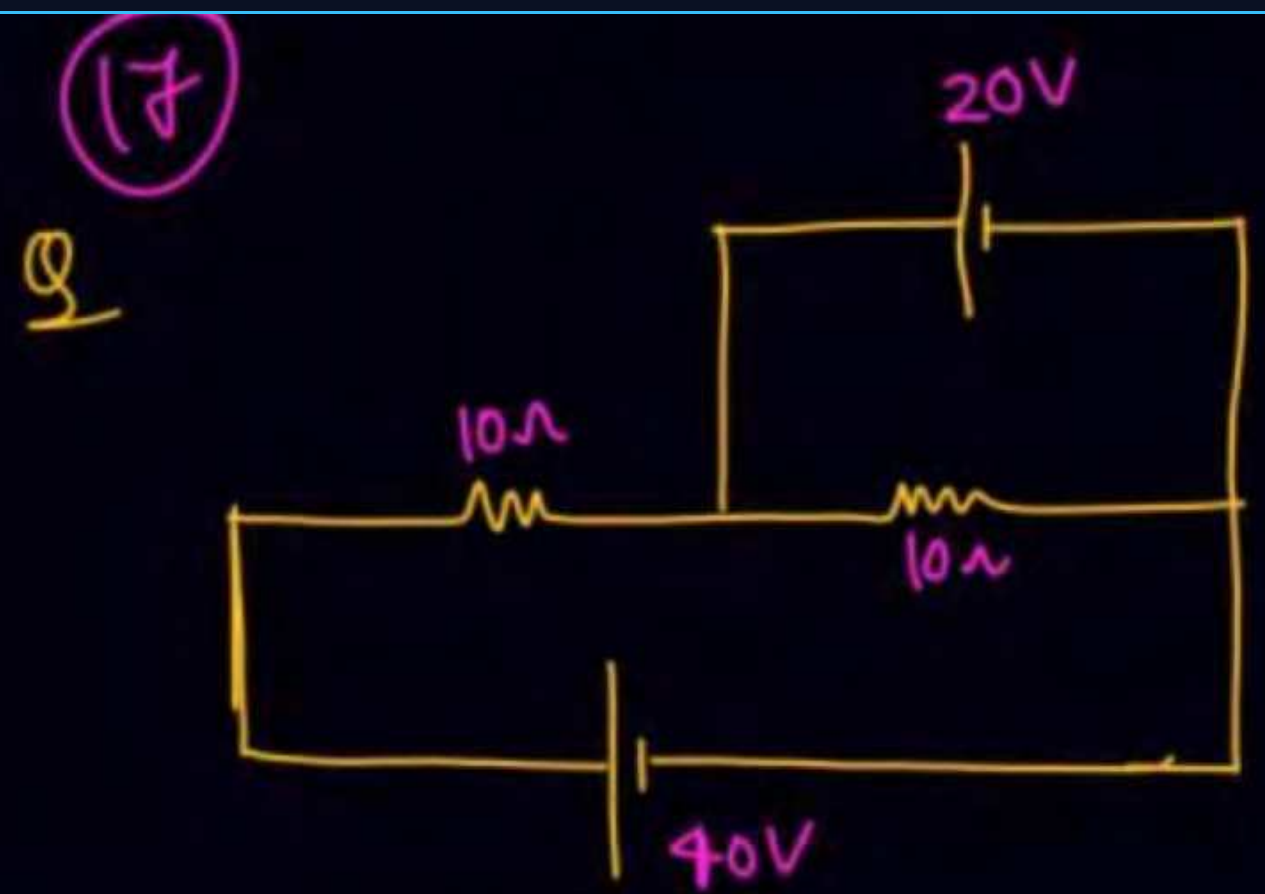


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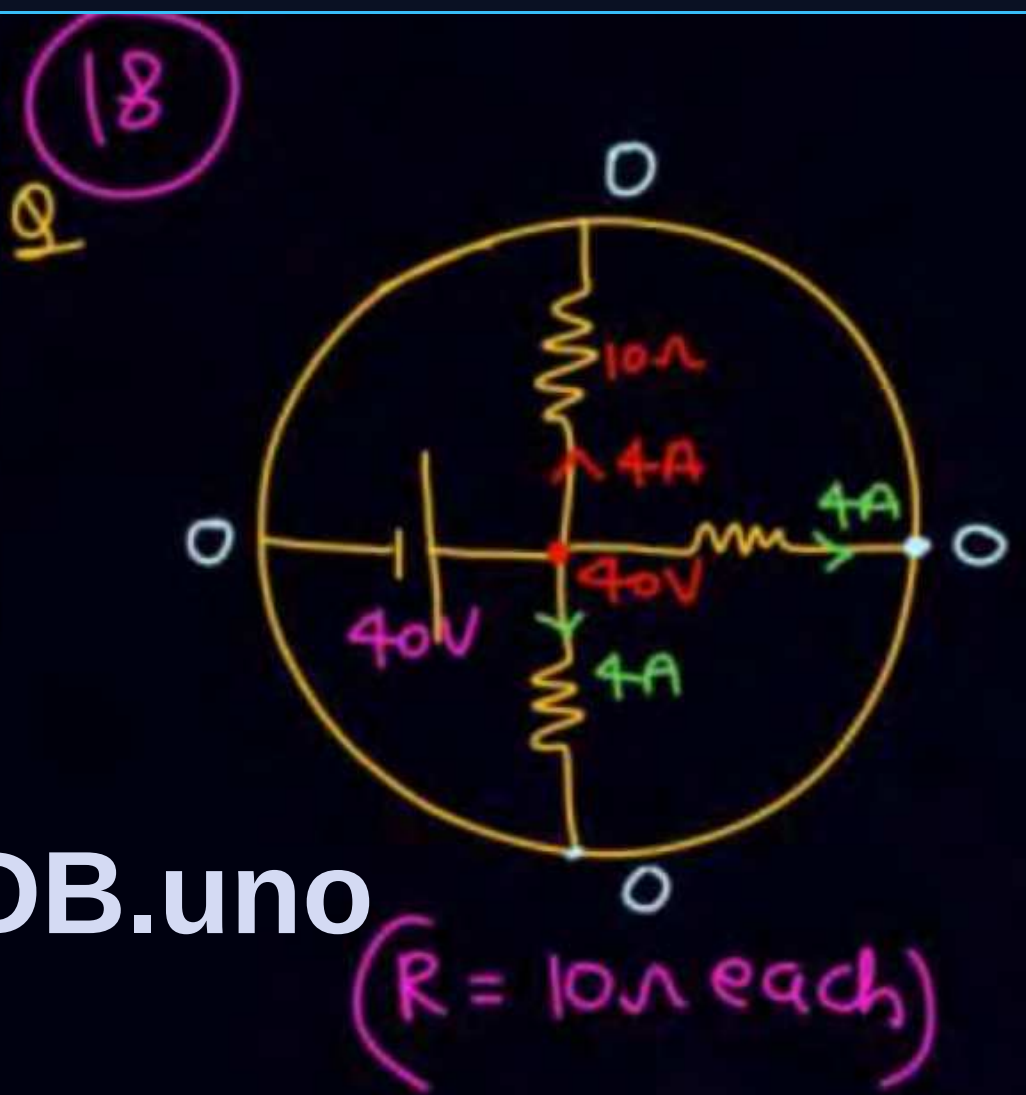
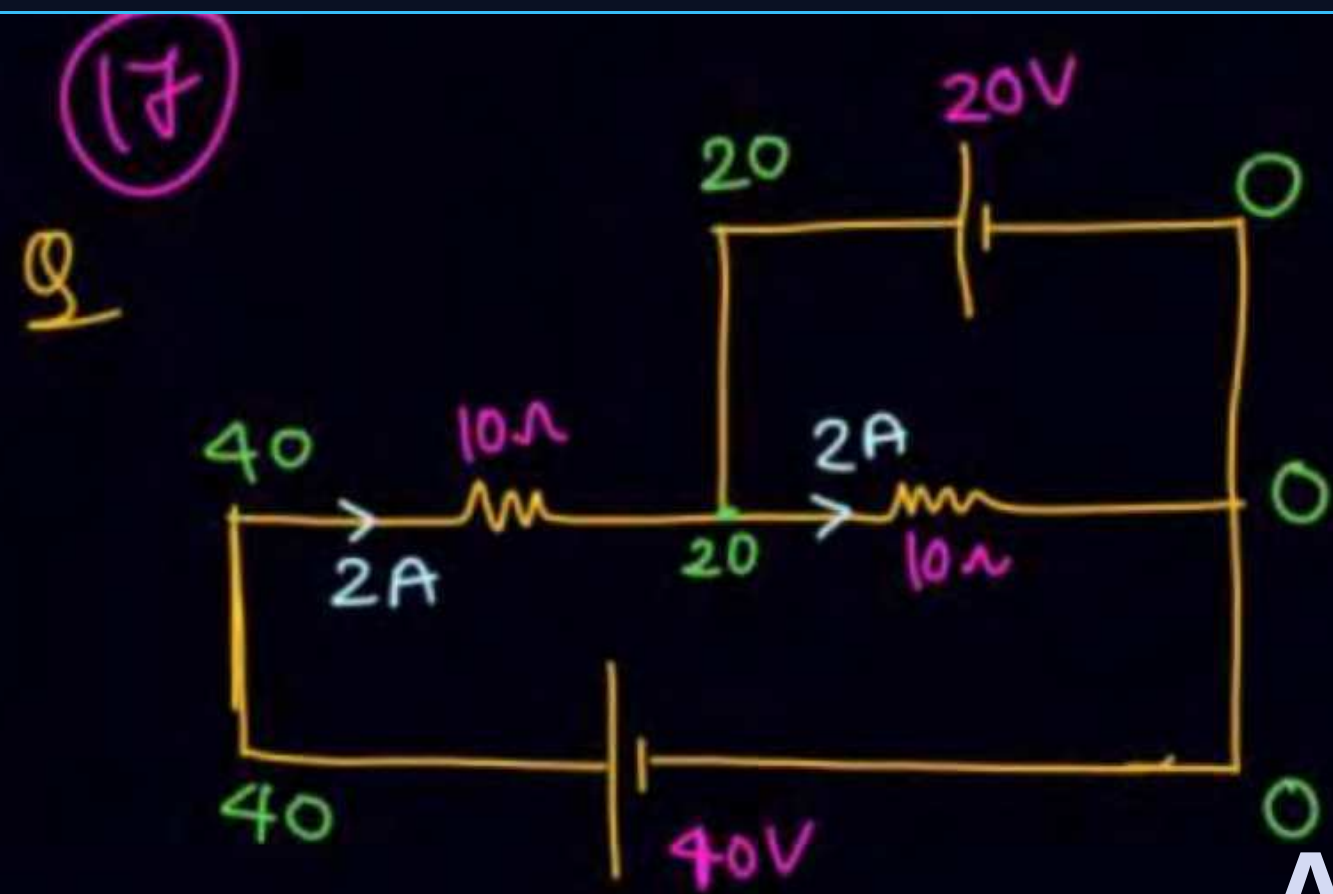




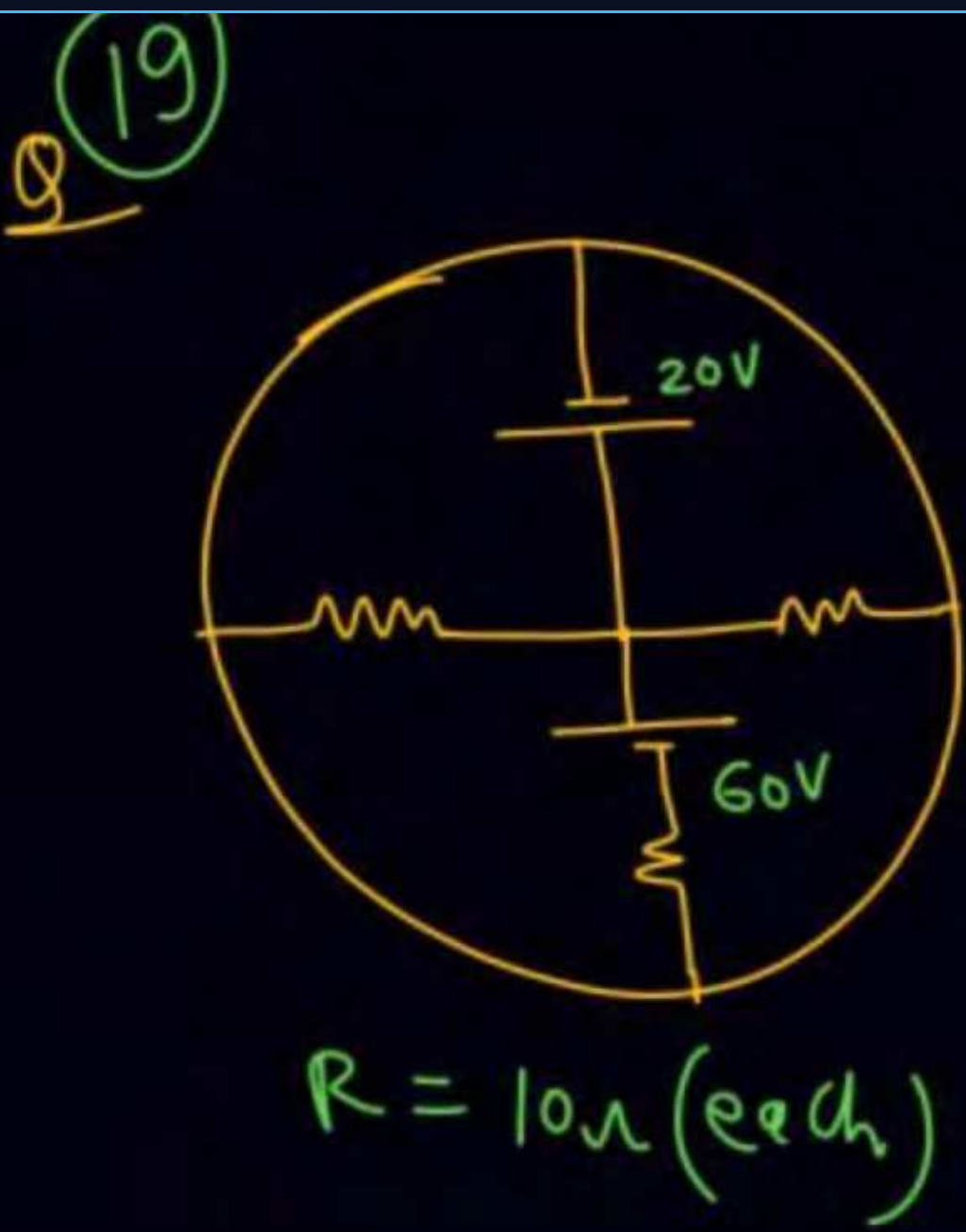
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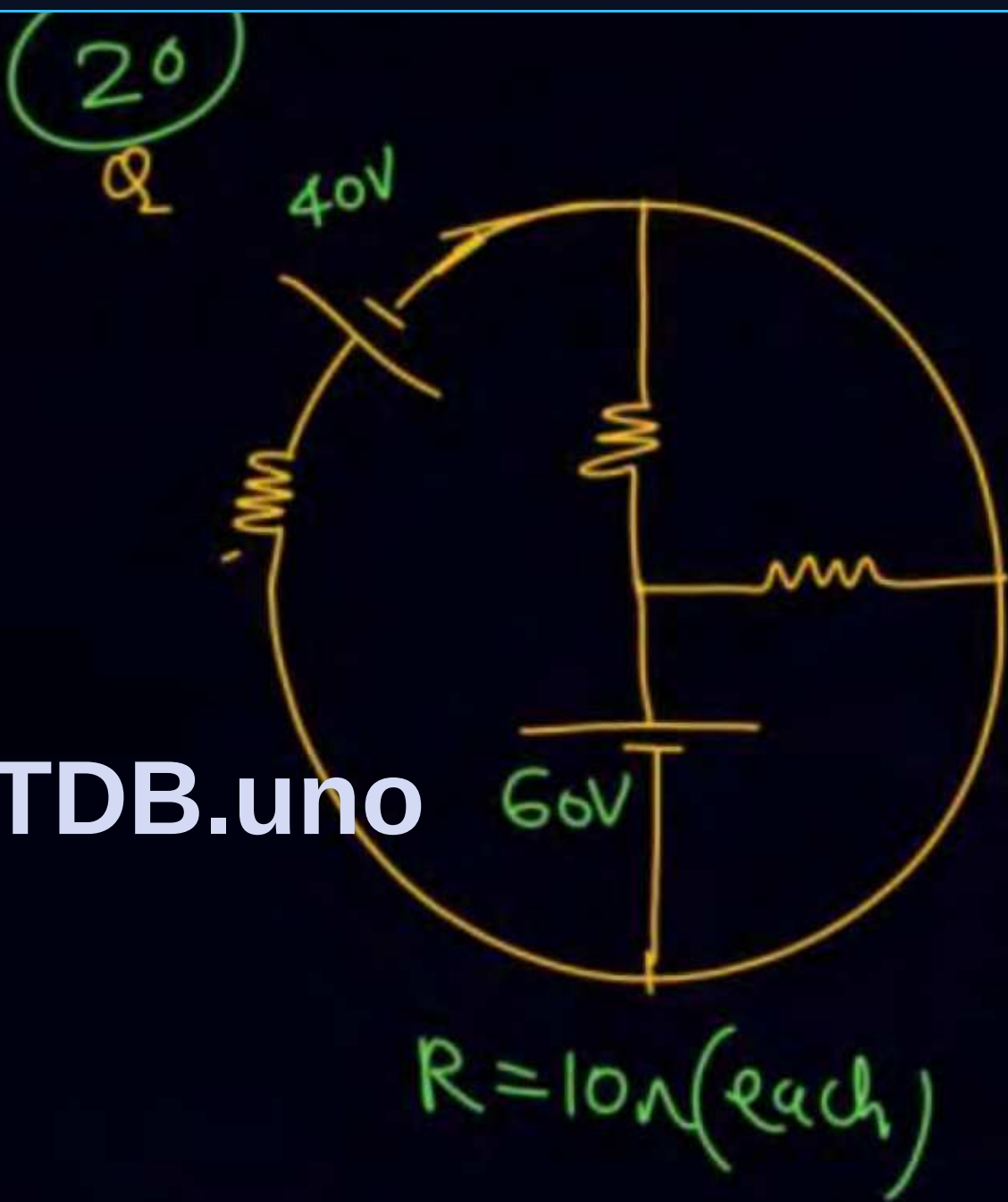
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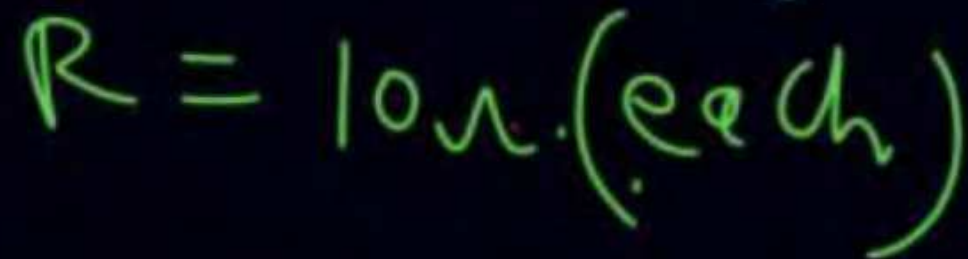


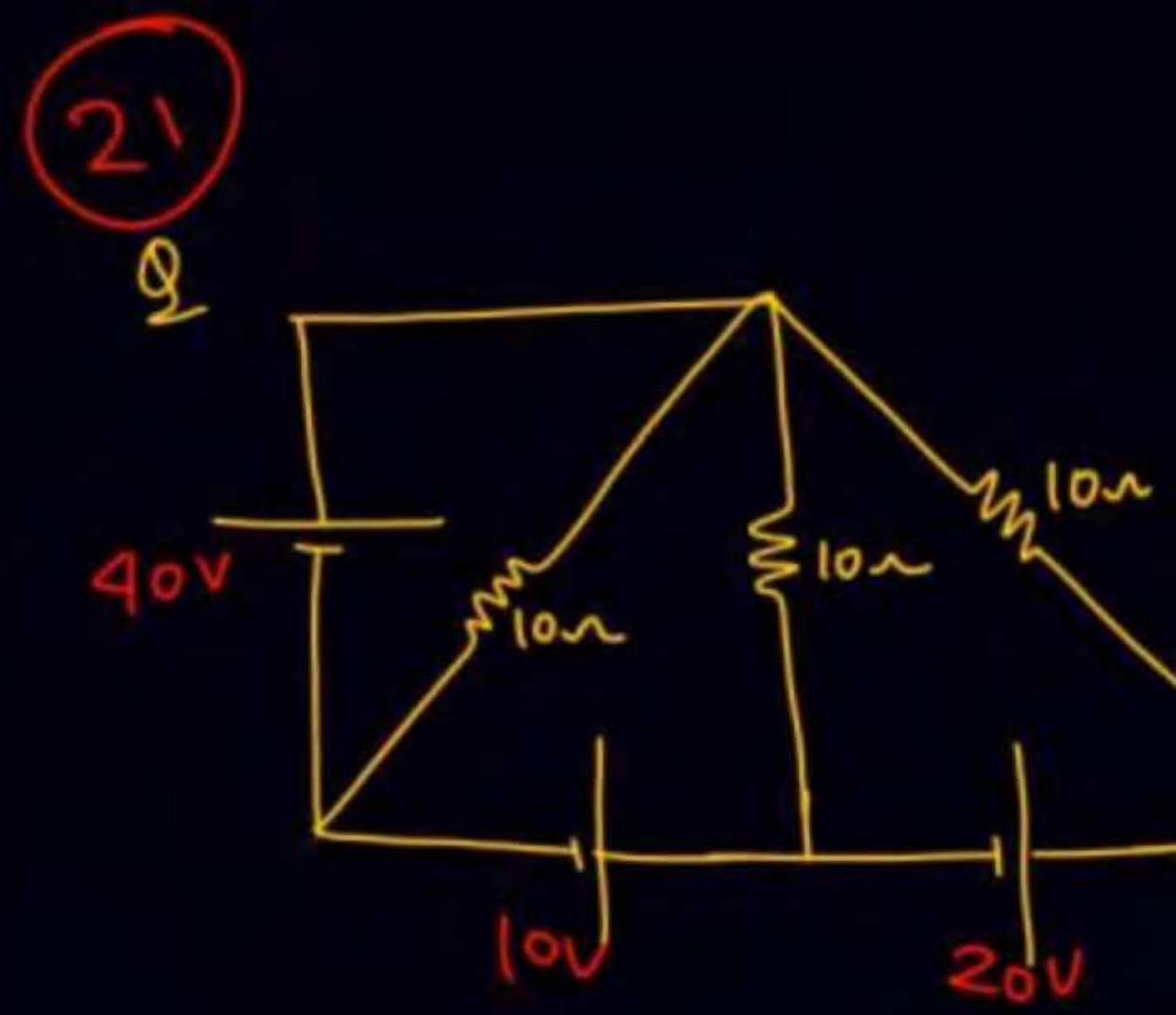
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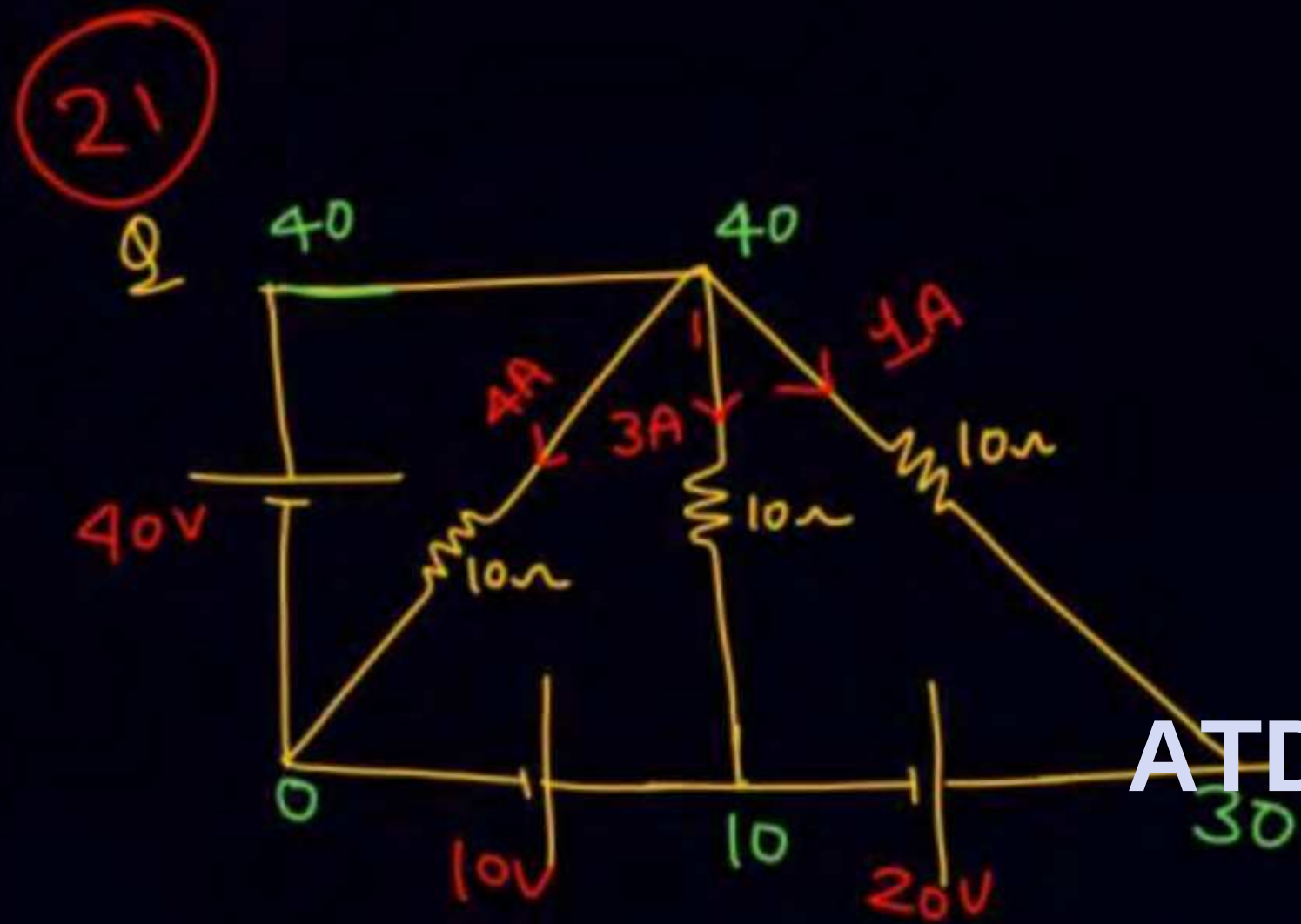
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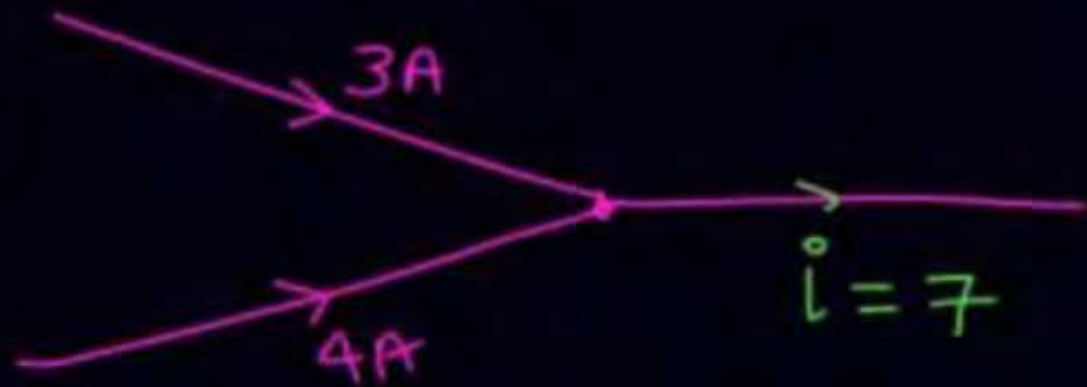
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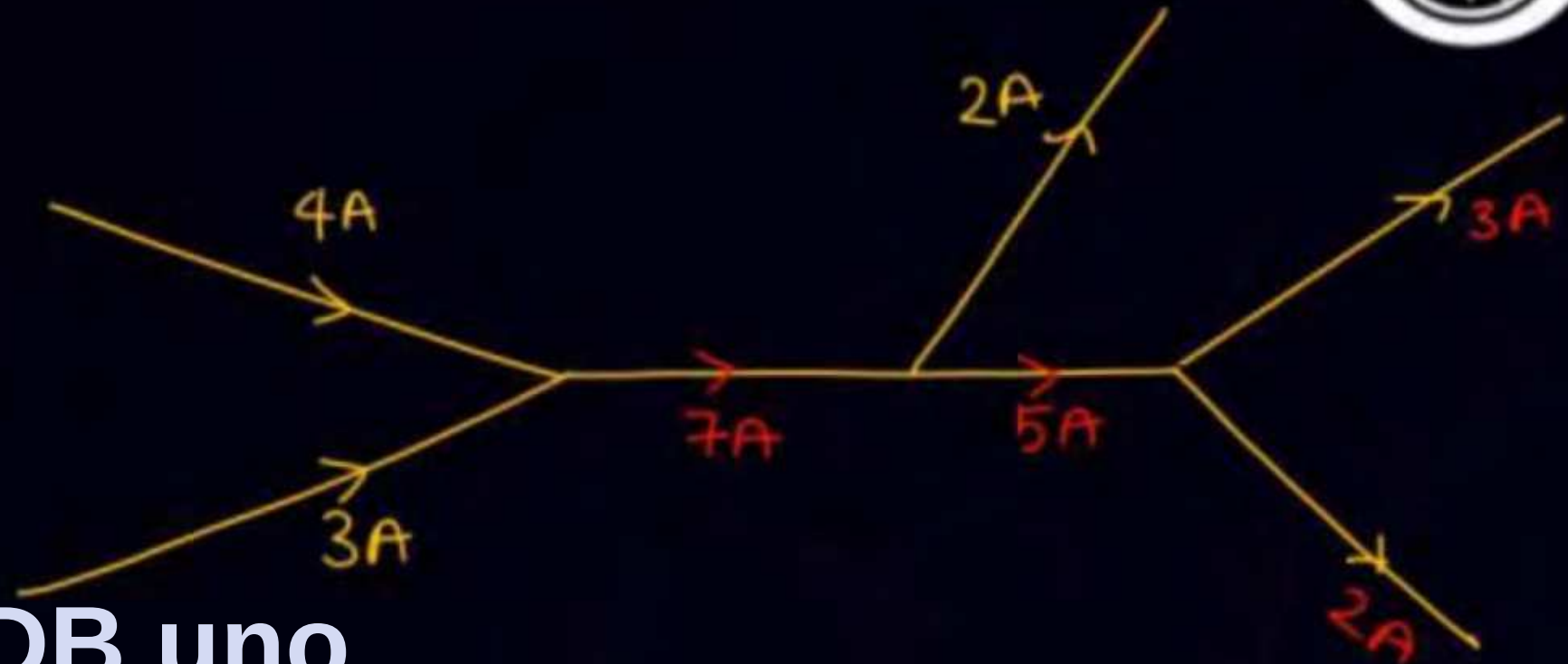
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junction Law



ATDB.uno

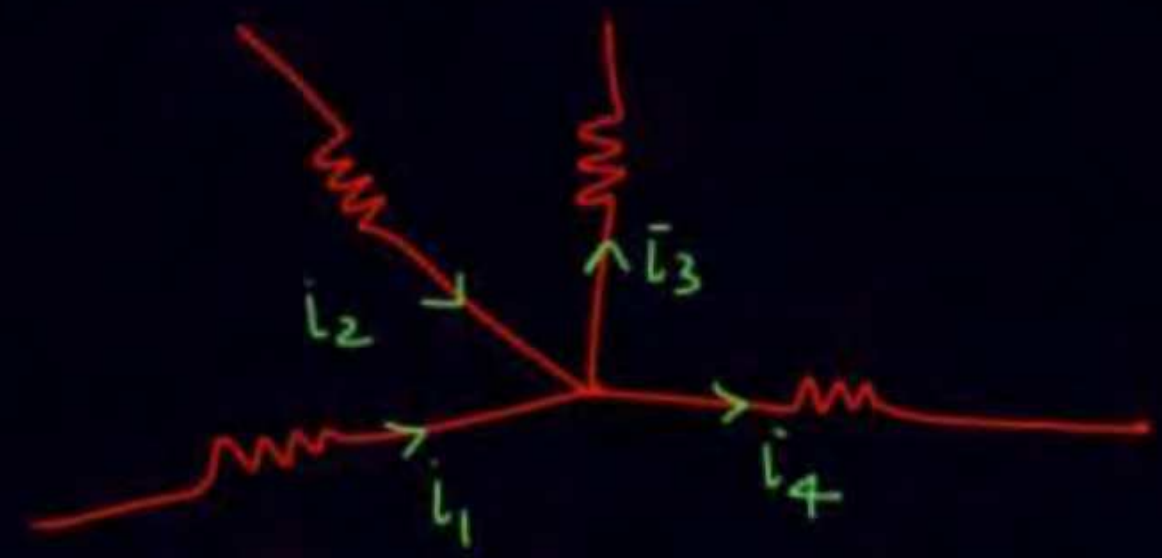




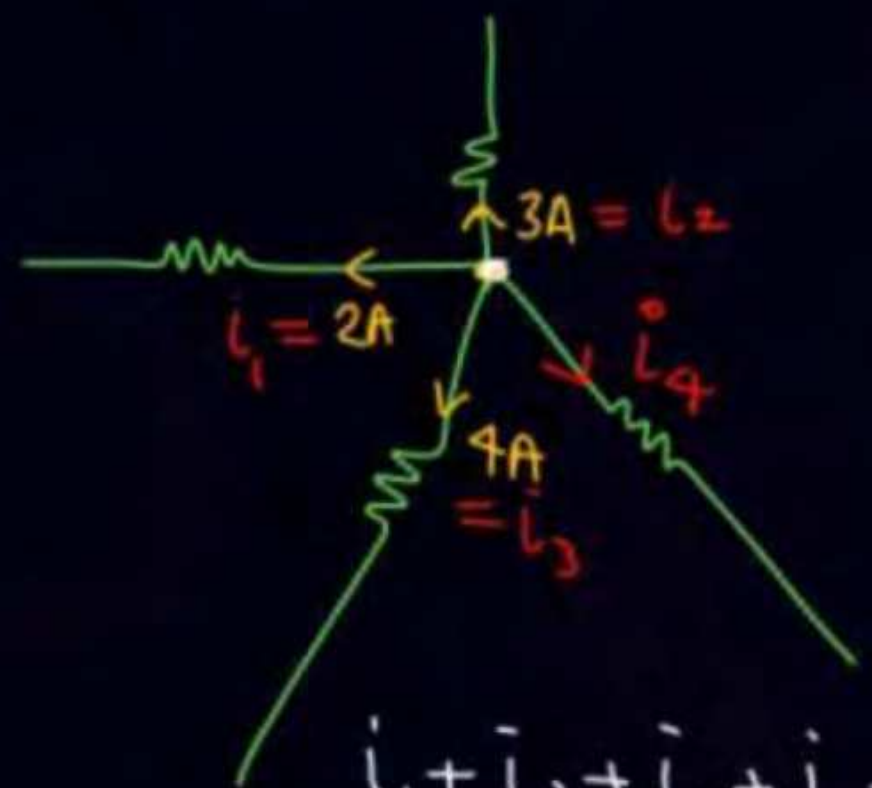
Junction Law

एल्का सा modification

जाने वाली साटे current का sum = 0



$$i_1 + i_2 = i_3 + i_4$$

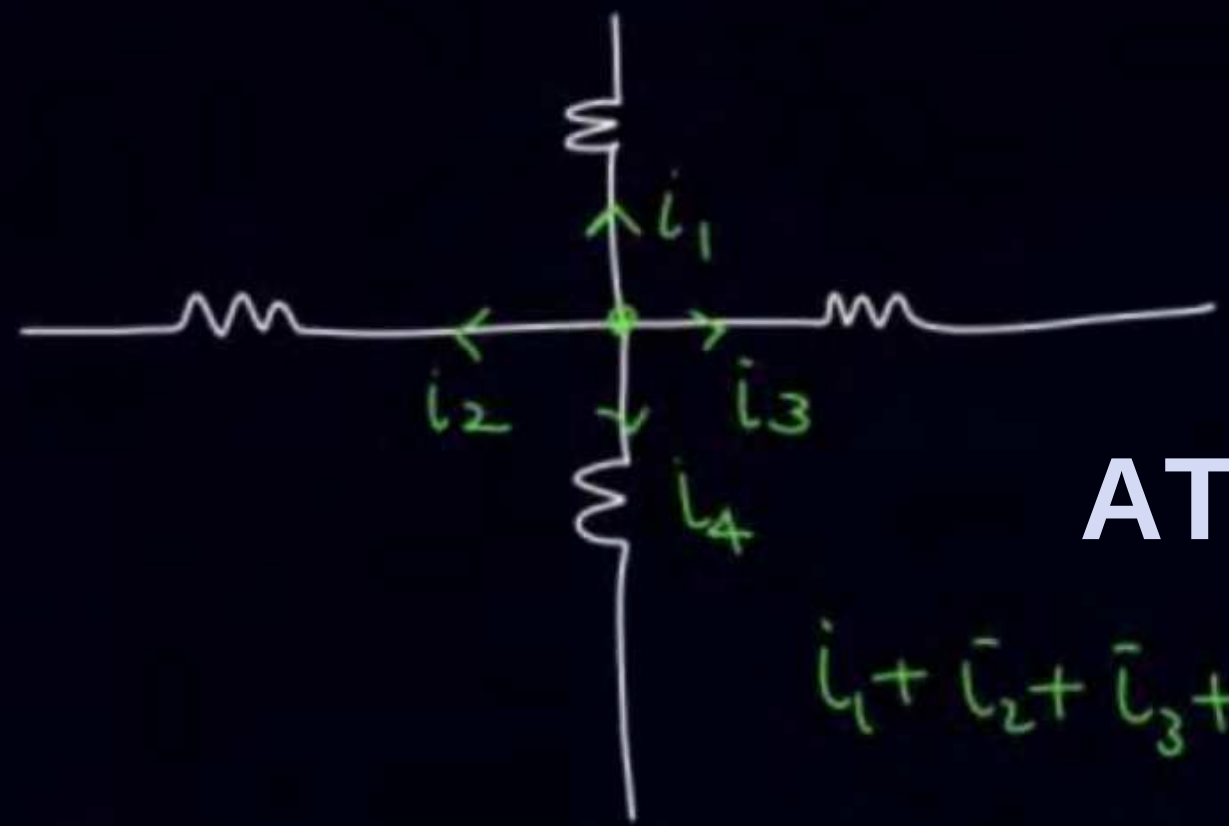


$$i_1 + i_2 + i_3 + i_4 = 0$$
$$2 + 3 + 4 + i_4 = 0$$
$$i_4 = -9$$

ATDB.uno

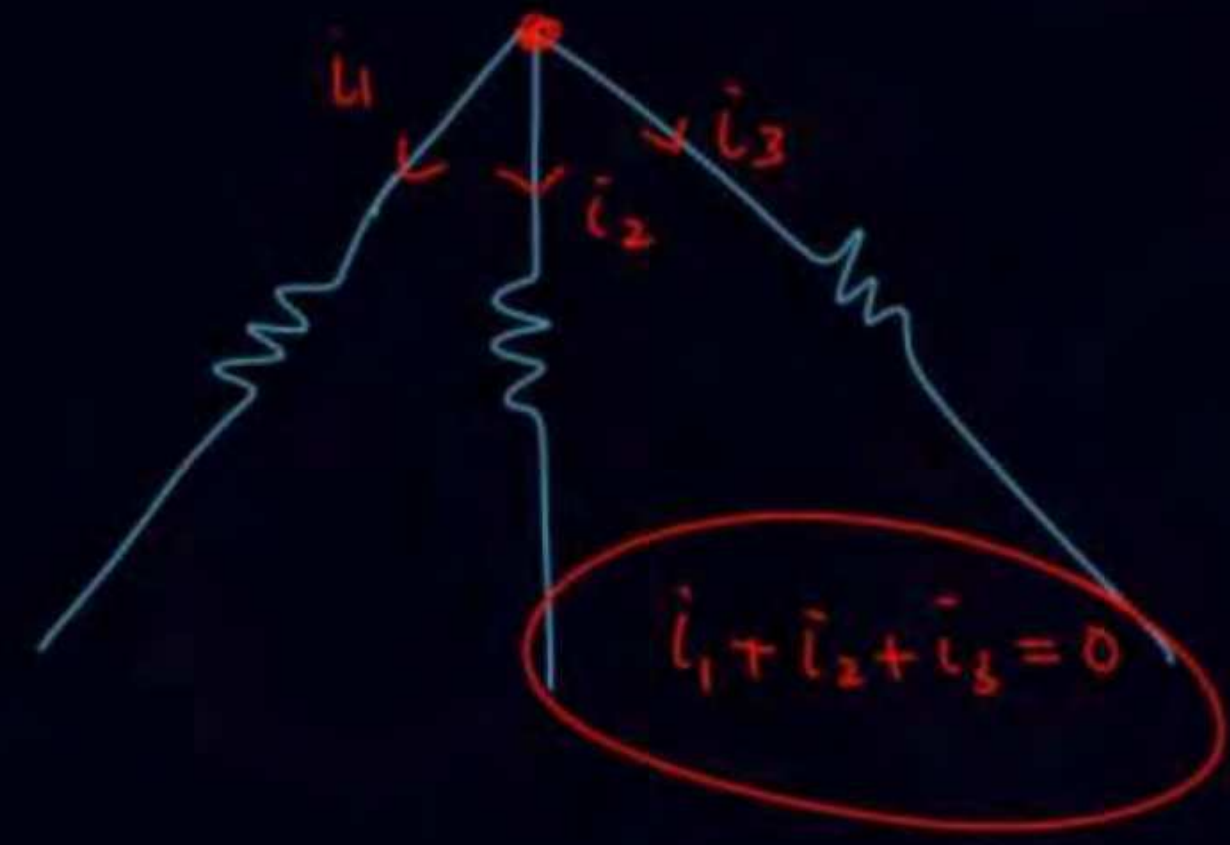


काम का Jxn Law



$i_1 + i_2 + i_3 + i_4 = 0$

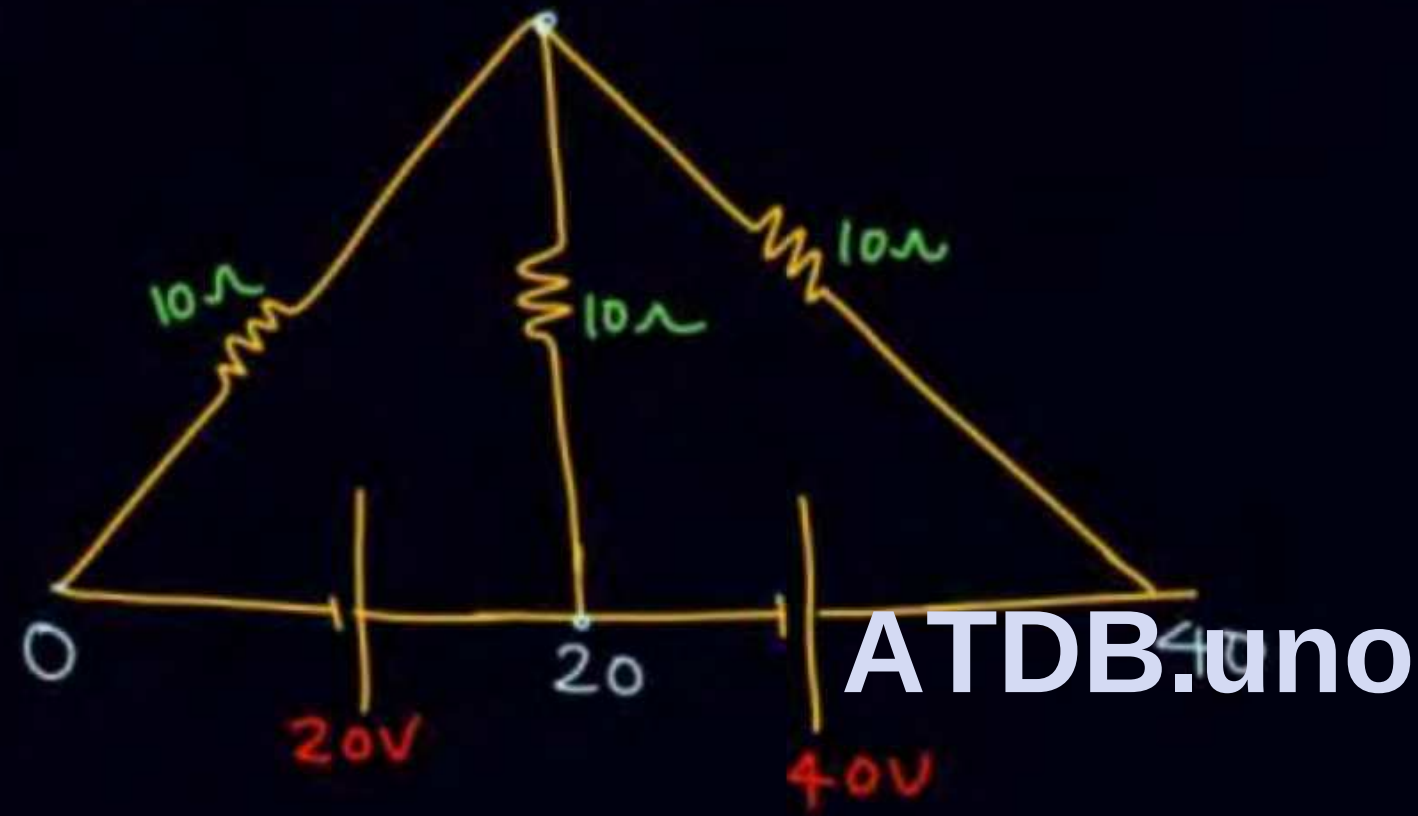
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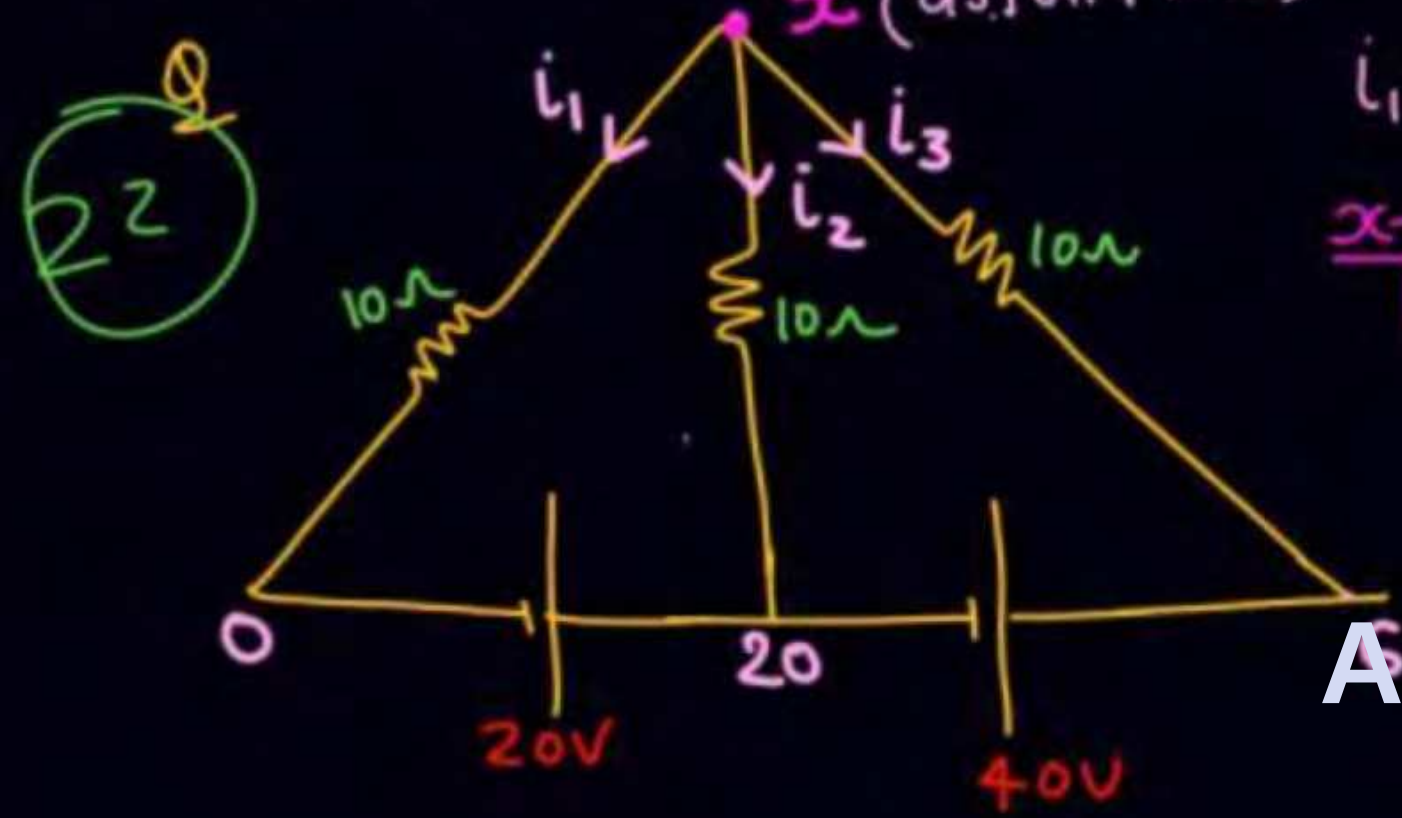
फंसने वाले सवाल



Q22



फं सने वाले सवाल

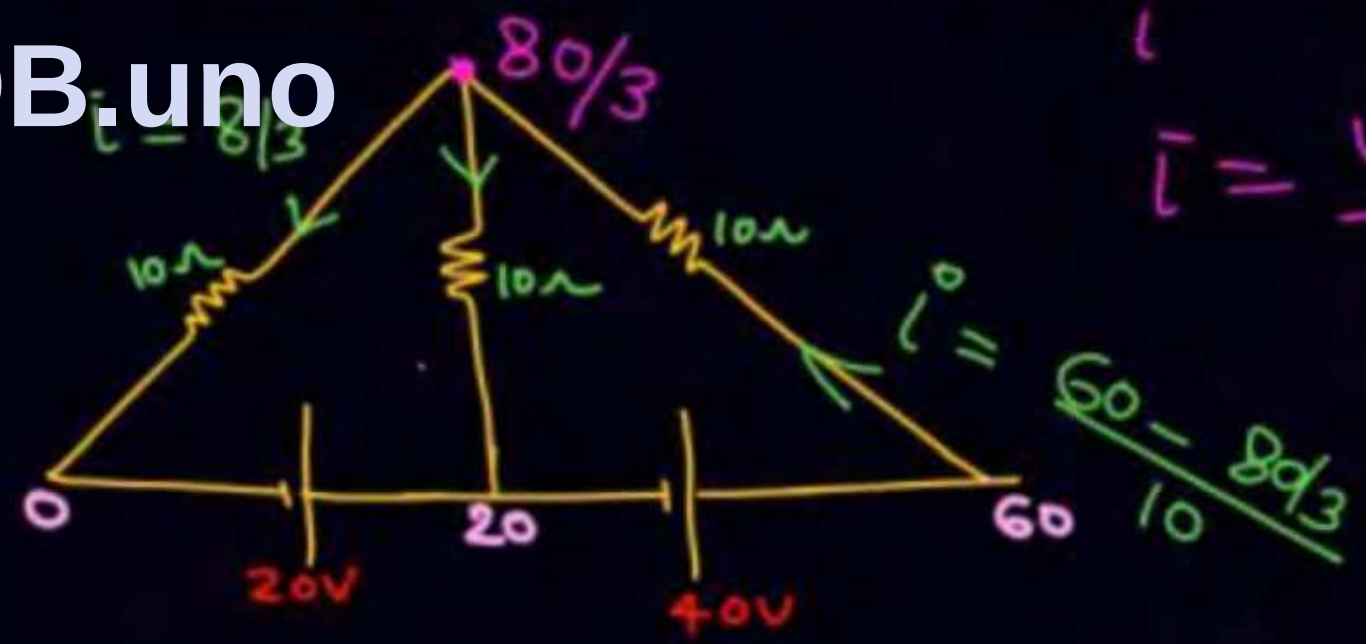


$i_1 + i_2 + i_3 = 0$

$\frac{x-0}{10} + \frac{x-20}{10} + \frac{x-60}{10} = 0$

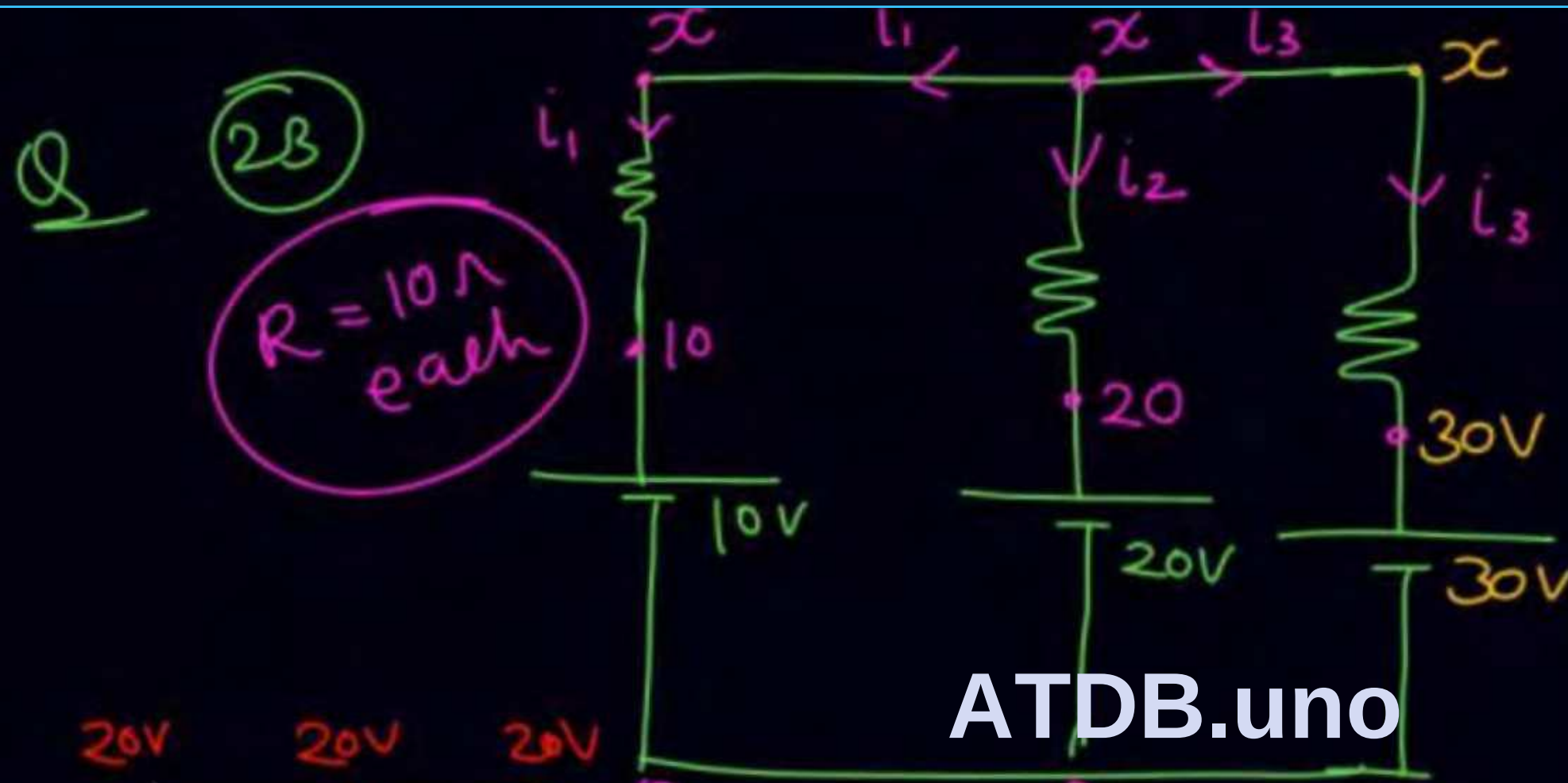
$x = \frac{80}{3}$

ATDB.uno



A $\rightarrow$ B

$i = \frac{V_A - V_B}{R}$



ATDB.uno

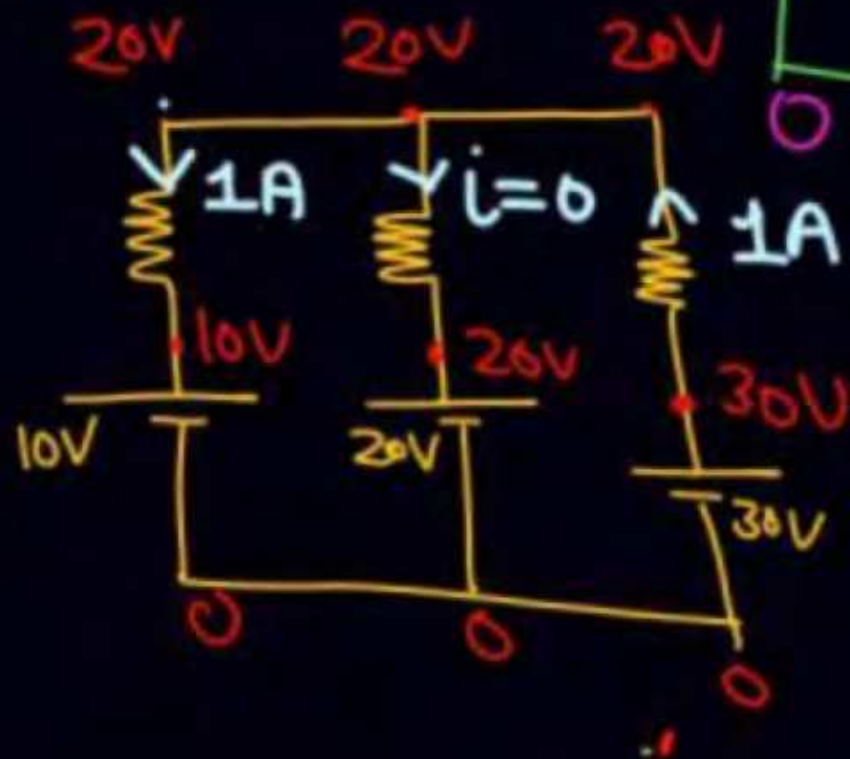
$$i_1 + i_2 + i_3 = 0$$

$$\frac{x-10}{10} + \frac{x-20}{10}$$

$$+ \frac{x-30}{10}$$

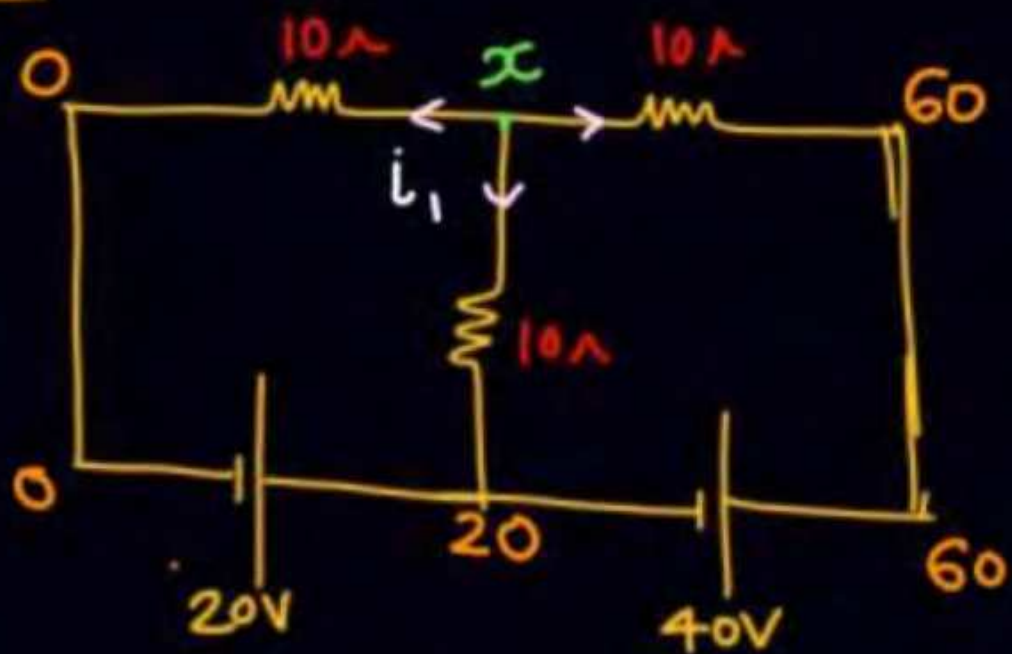
$$x = 20$$

$$= 0$$



24

Q



$$i_1 + i_2 + i_3 = 0$$

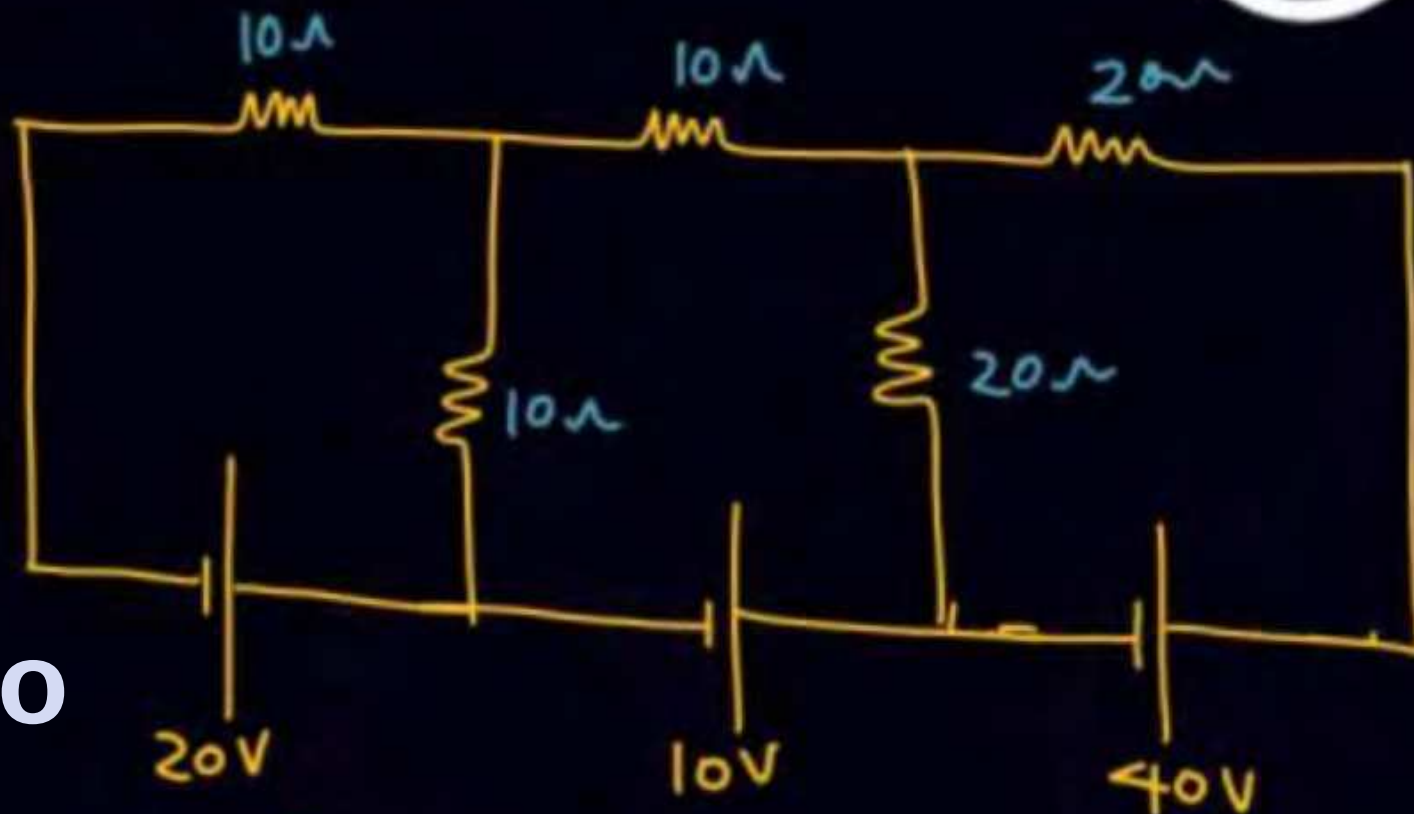
$$\frac{x-0}{10} + \frac{x-20}{10} + \frac{x-60}{10} = 0$$

$x = 80/3$

$$i_1 = \frac{\frac{80}{3} - 0}{10}$$

25 (tough)

Q



(next page)

ATDB.uno



$$\frac{x-0}{10} + \frac{x-20}{10} + \frac{x-y}{10} = 0$$

3x - y = 20

1

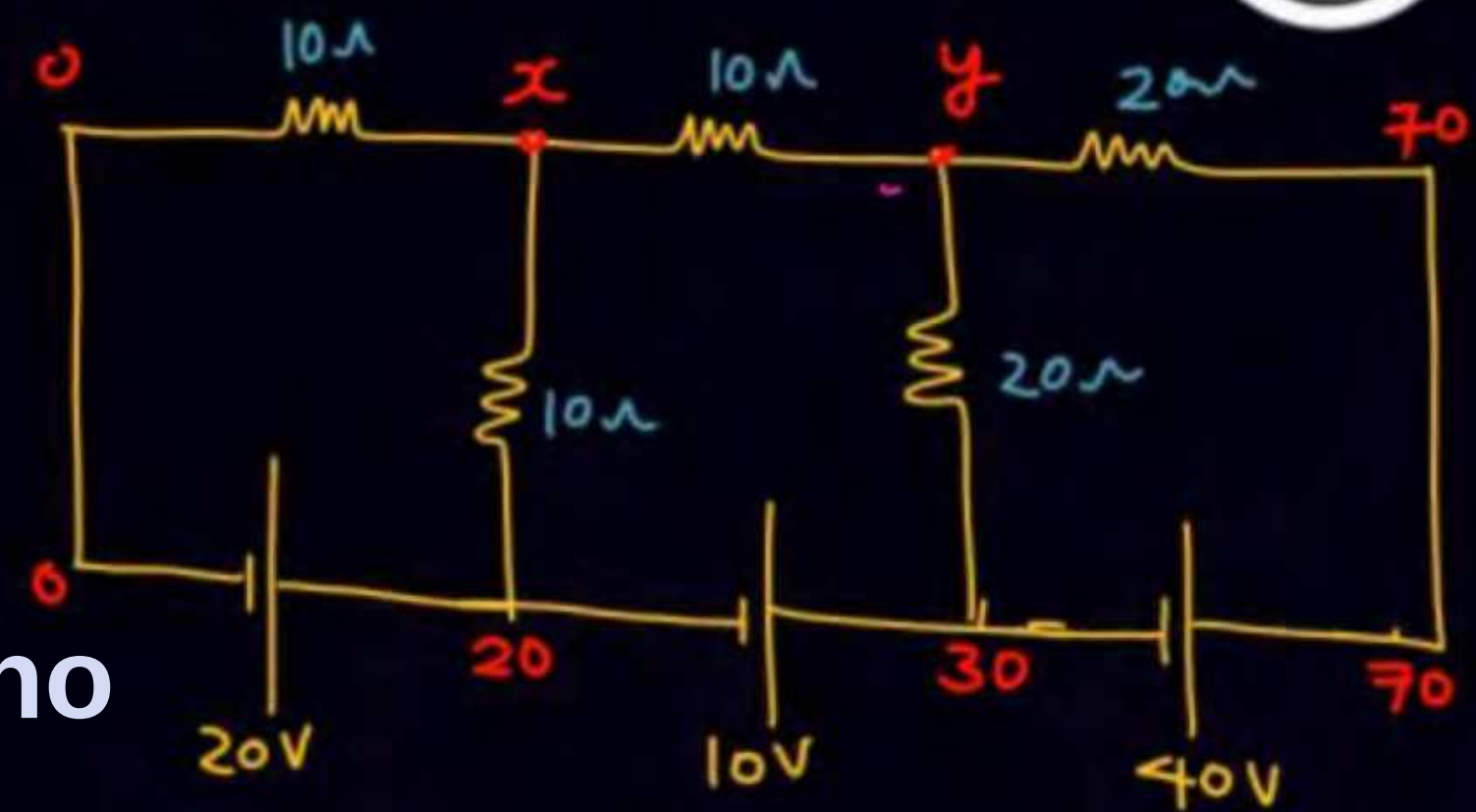
$$\frac{y-x}{10} + \frac{y-30}{20} + \frac{y-70}{20} = 0$$

$$2y - 2x + y - 30 + y - 70 = 0$$

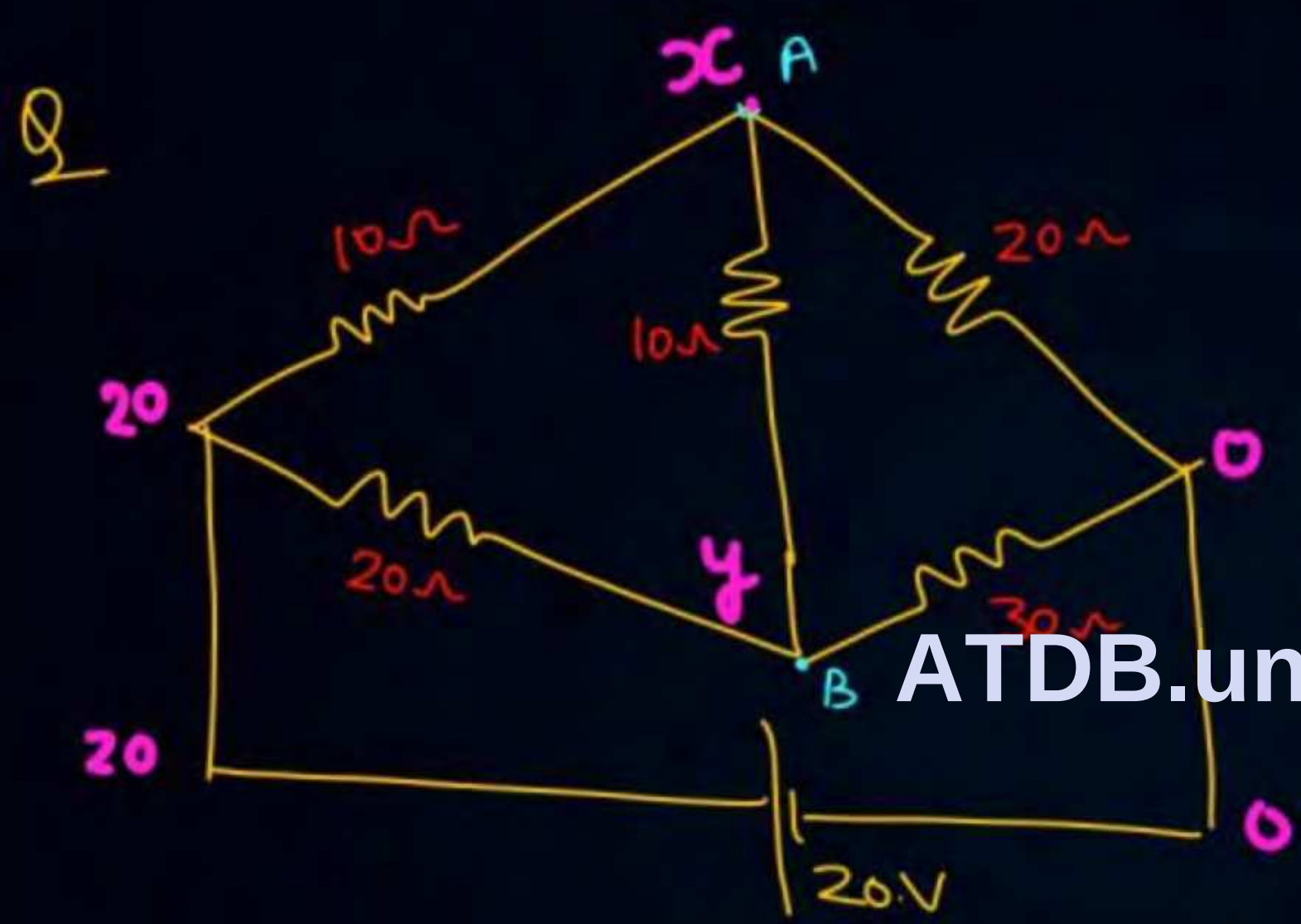
4y - 2x = 100

2

25 (tough)

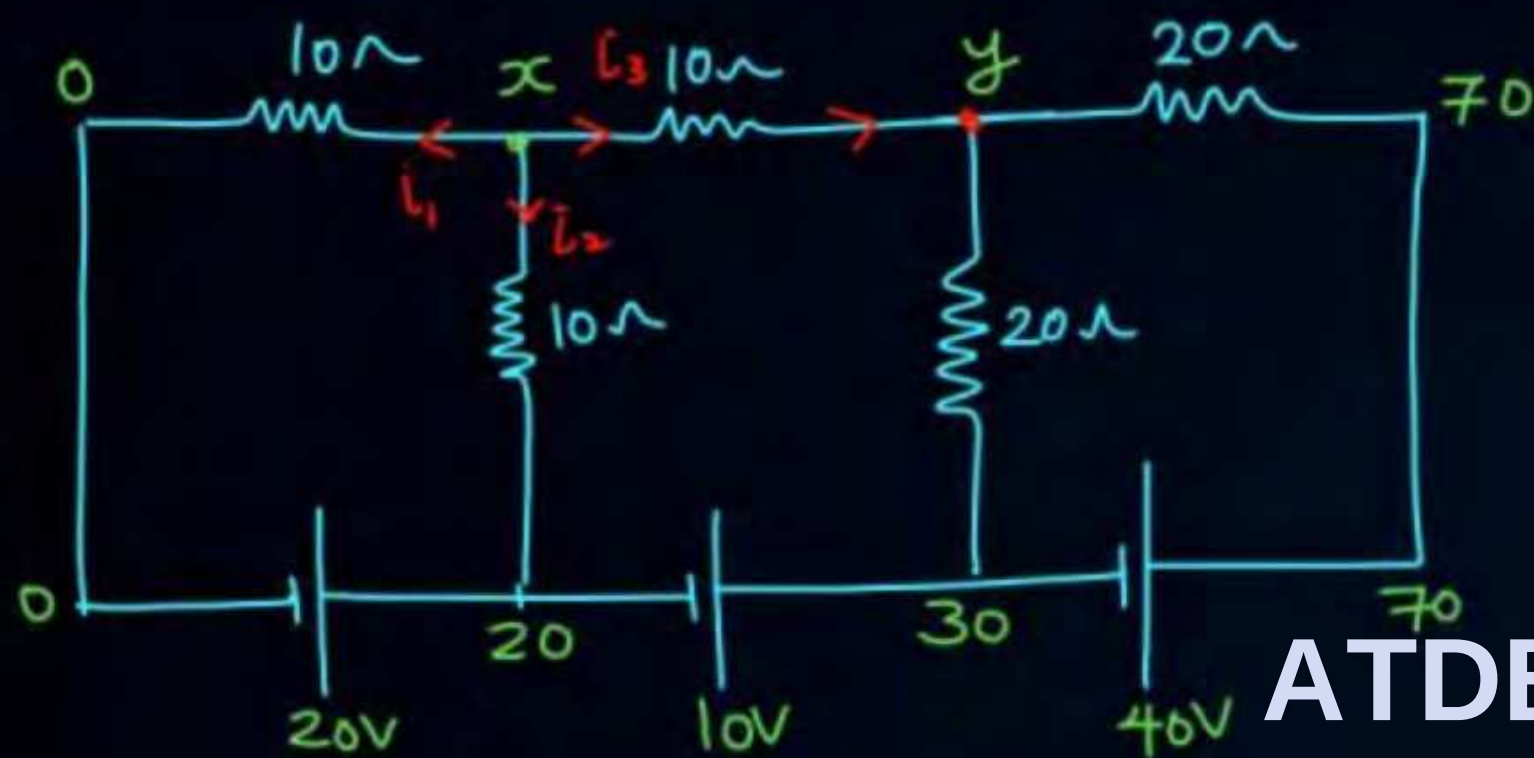


ATDB.uno



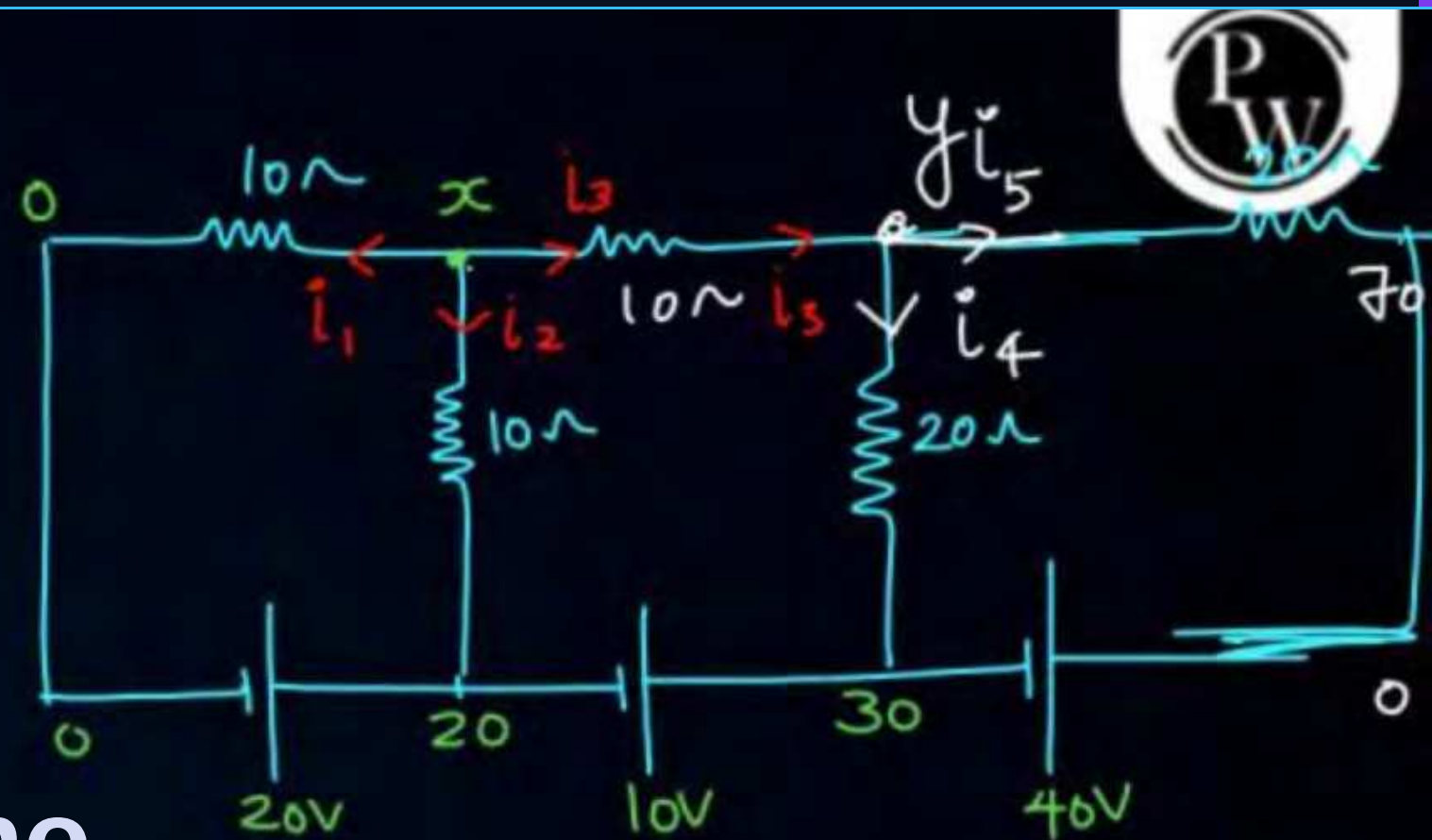
$$\left. \begin{aligned} \frac{x-20}{10} + \frac{x-y}{10} + \frac{x-0}{20} &= 0 \\ \frac{y-20}{20} + \frac{y-x}{10} + \frac{y-0}{30} &= 0 \end{aligned} \right\} \text{SKC}$$

ATDB.uno



$$\frac{x-0}{10} + \frac{x-20}{10} + \frac{x-y}{10} = 0$$

$$\frac{y-x}{10} + \frac{y-30}{20} + \frac{y-70}{20} = 0$$

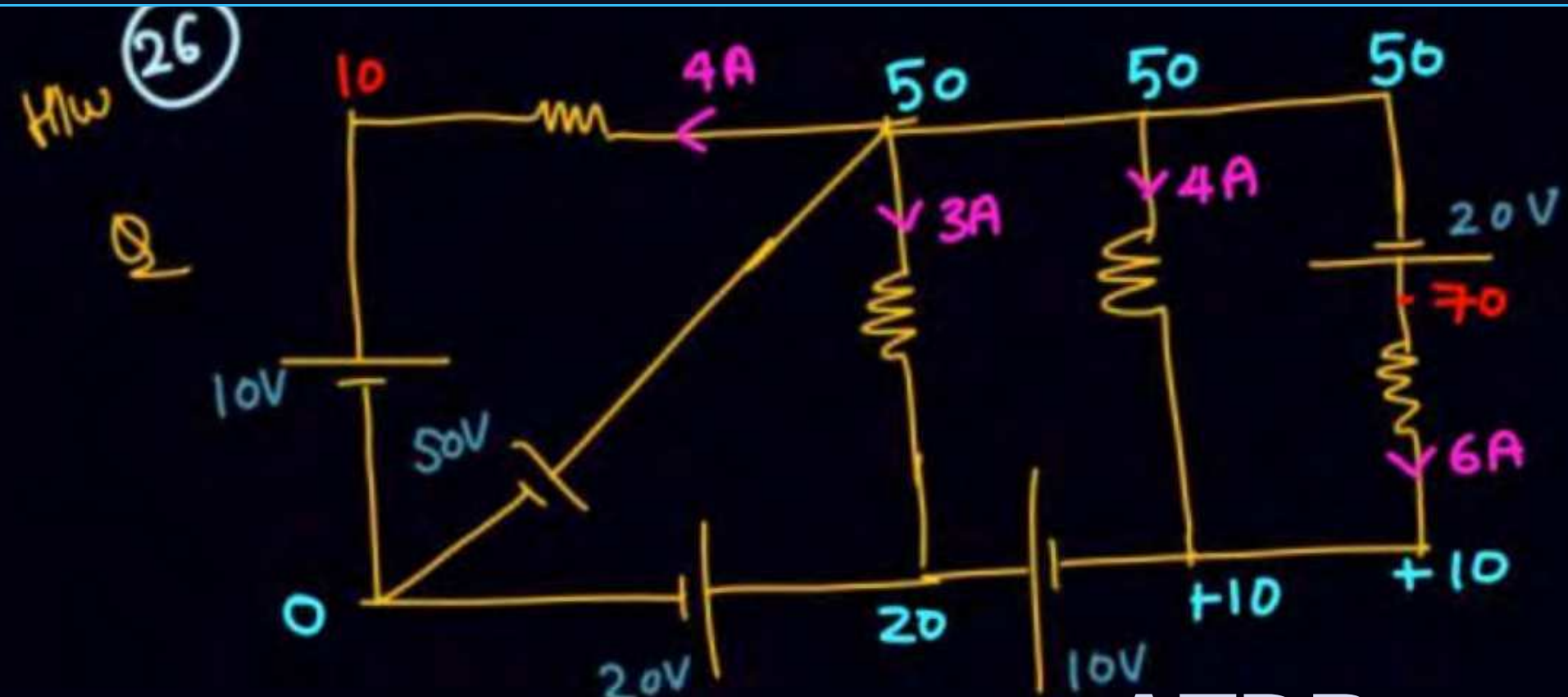


$$i_1 + i_2 + i_3 = 0 \Rightarrow \frac{x-0}{10} + \frac{x-20}{10} + \frac{x-y}{10} = 0$$

$$i_3 = i_4 + i_5$$

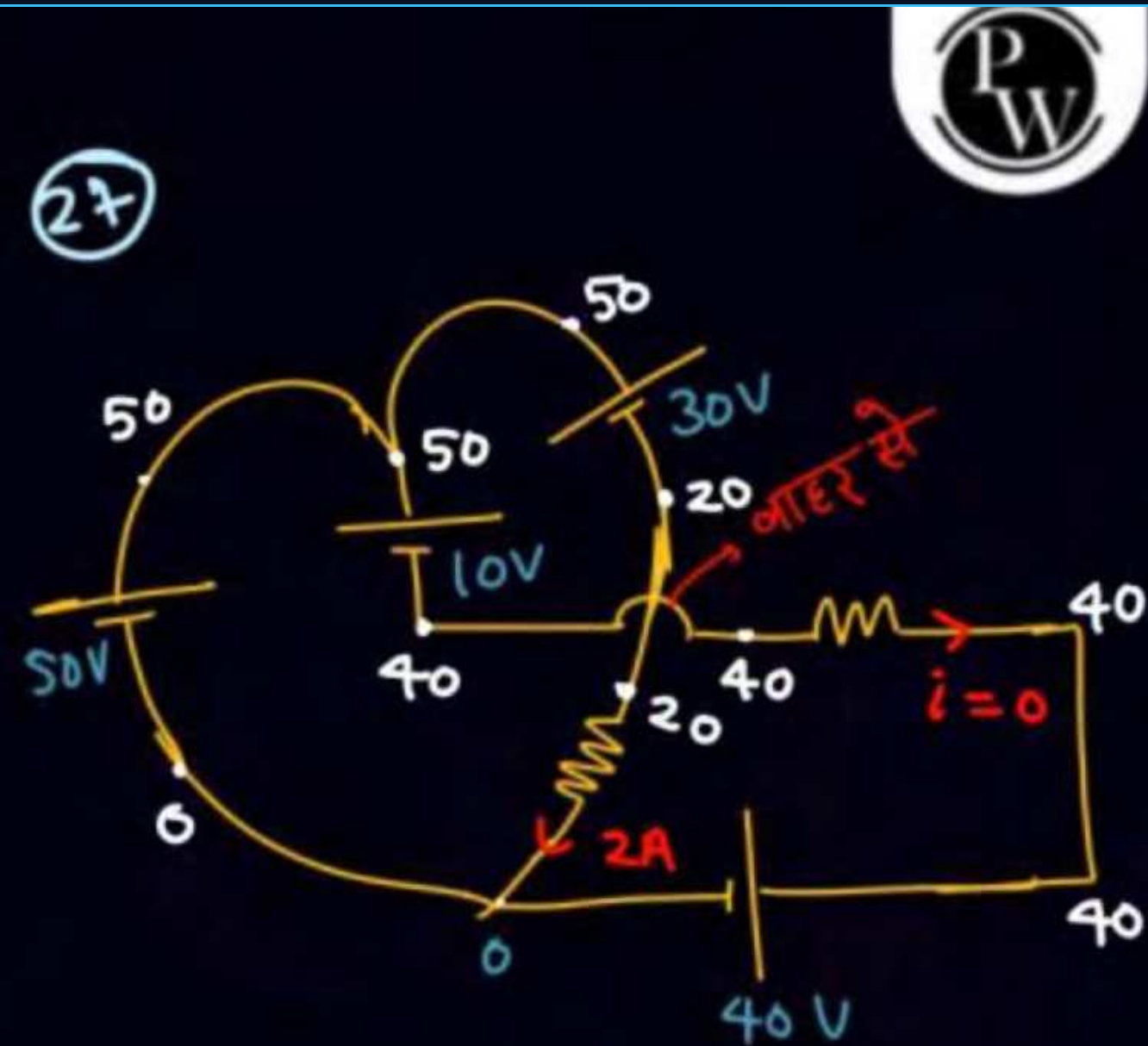
$$\frac{x-y}{10} = \frac{y-30}{20} + \frac{y-70}{20}$$

$$0 = \frac{y-30}{20} + \frac{y-70}{20} + \left(\frac{y-x}{10} \right) = 0$$



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$R = 10 \Omega (\text{each})$



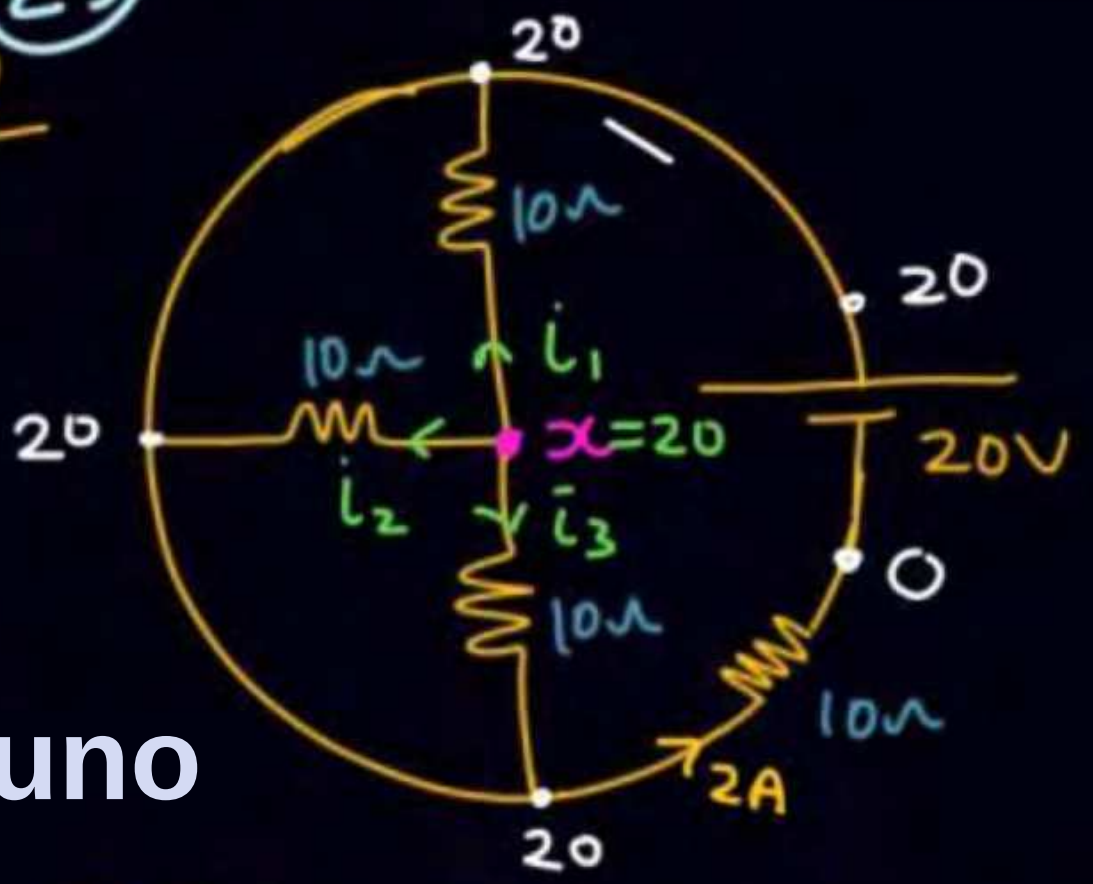


28
Q



$$\frac{x-20}{10} + \frac{x-50}{10} + \frac{x+30}{10} = 0$$
$$R = 10\Omega \text{ (each)}$$
$$x = 40/3$$

29
Q



$$\frac{x-20}{10} + \frac{x-20}{10} + \frac{x-20}{10} \Rightarrow x = 20$$
$$i_1 = i_2 = i_3 = 0$$



ATDB.uno

$$\frac{x-0}{10} + \frac{x-10}{10} + \frac{x-0}{10} + \frac{x-y}{10} = 0 \Rightarrow$$

$$\frac{y-x}{10} + \frac{y-20}{10} + \frac{y-0}{10} = 0$$

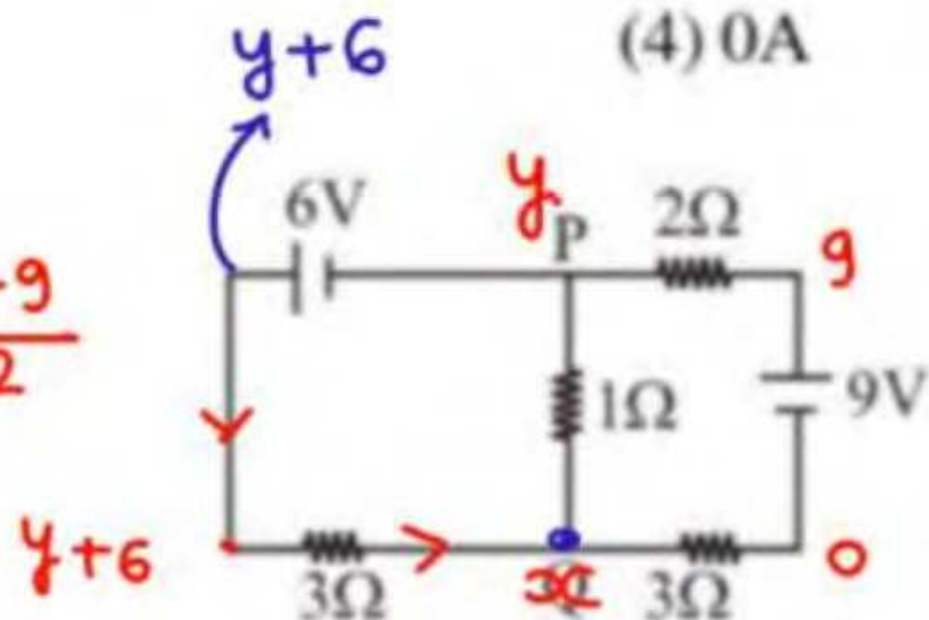
$$\begin{aligned} 4x - y &= 10 \\ 3y - x &= 20 \end{aligned}$$

10. In the circuit shown, the current in the 1Ω resistor is :-

[JEE-Main 2015]

- (1) 0.13 A, from Q to P
(2) 0.13 A, from P to Q
(3) 1.3 A, from P to Q
(4) 0A

$$0 = \frac{y+6-x}{3} + \frac{y-x}{1} + \frac{y-9}{2}$$



$$\frac{x-(y+6)}{3} + \frac{x-y}{1} + \frac{x-9}{3} = 0$$

$$Aw = \frac{x-y}{1}$$

दर्शाये गये परिपथ में 1Ω प्रतिरोधक से प्रवाहित धारा होगी :-

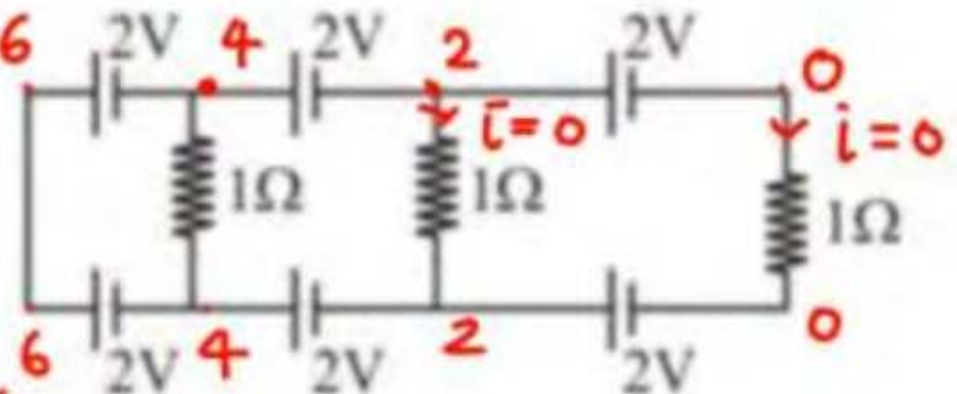
[JEE-Main 2015]

- (1) 0.13 A, Q से P को
(2) 0.13 A, P से Q को
(3) 1.3 A, P से Q को
(4) 0 A

Ans. (1)

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ऊपर दिये गये परिपथ में प्रत्येक प्रतिरोध में धारा का मान होगा :-



(1) 0.5 A

(2) 0 A

(3) 1 A

(4) 0.25 A

Ans. (2)

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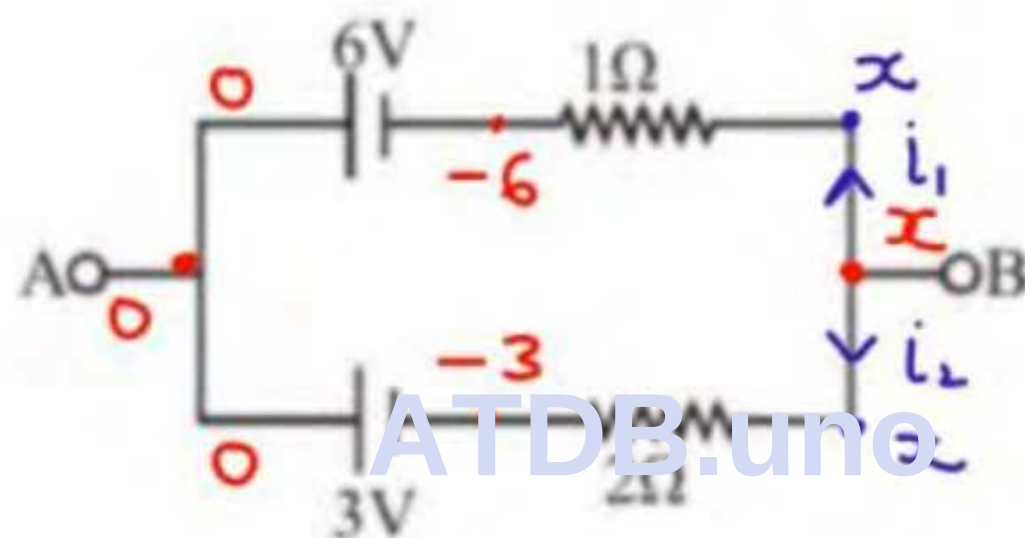
33

across AB in volts is

दो बैटरियाँ जिनके विद्युत वाहक बल तथा आंतरिक प्रतिरोध भिन्न-भिन्न हैं, को चित्र में दर्शाये अनुसार जोड़ा गया है।

बिंदुओं A व B के बीच विभवान्तर ज्ञात कीजिए।

[IIT-JEE 2011]



$$i_1 + i_2 = 0$$

$$\frac{x+6}{1} + \frac{x+3}{2} = 0$$

$$2x + 12 + x + 3 = 0$$

$$3x = -15$$

$$x = -5$$

Ans. 5

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the figure. The current in resistance R_2 would be zero if :-

[JEE Advanced 2014]

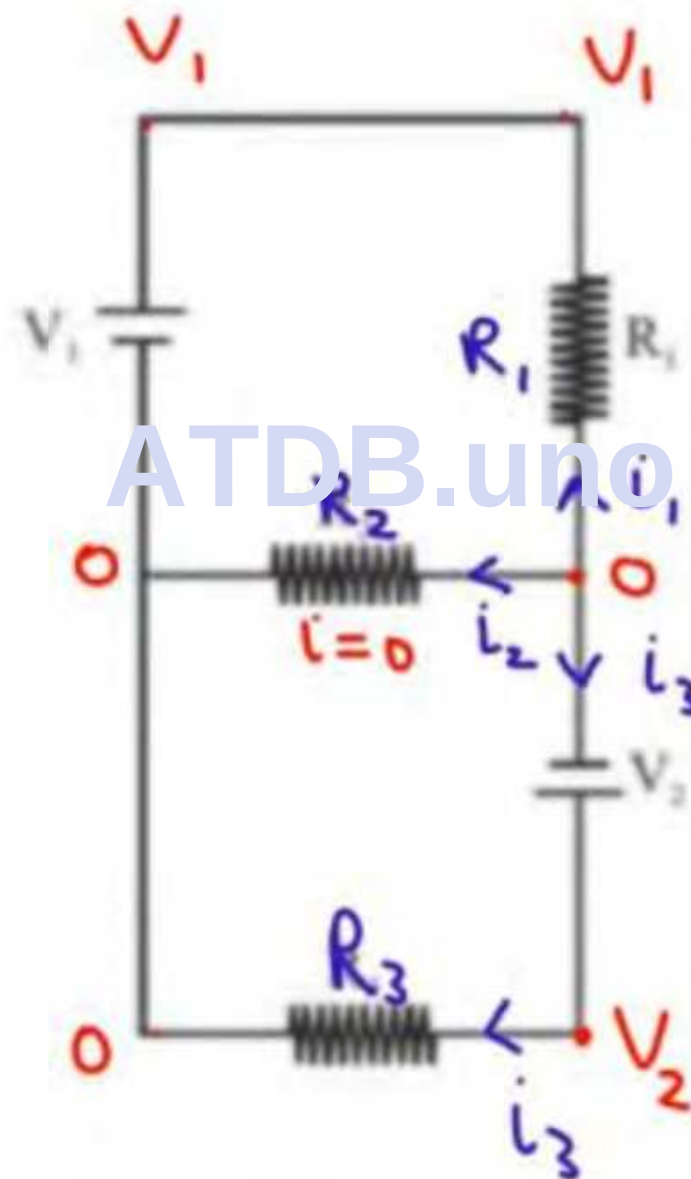
(A) $V_1 = V_2$ and $R_1 = R_2 = R_3$

(C) $V_1 = 2V_2$ and $2R_1 = 2R_2 = R_3$

(B) $V_1 = V_2$ and $R_1 = 2R_2 = R_3$

(D) $2V_1 = V_2$ and $2R_1 = R_2 = R_3$

R_2 कितना भी हो
जर्क नहीं पड़ता



$$i_1 + i_2 + i_3 = 0$$

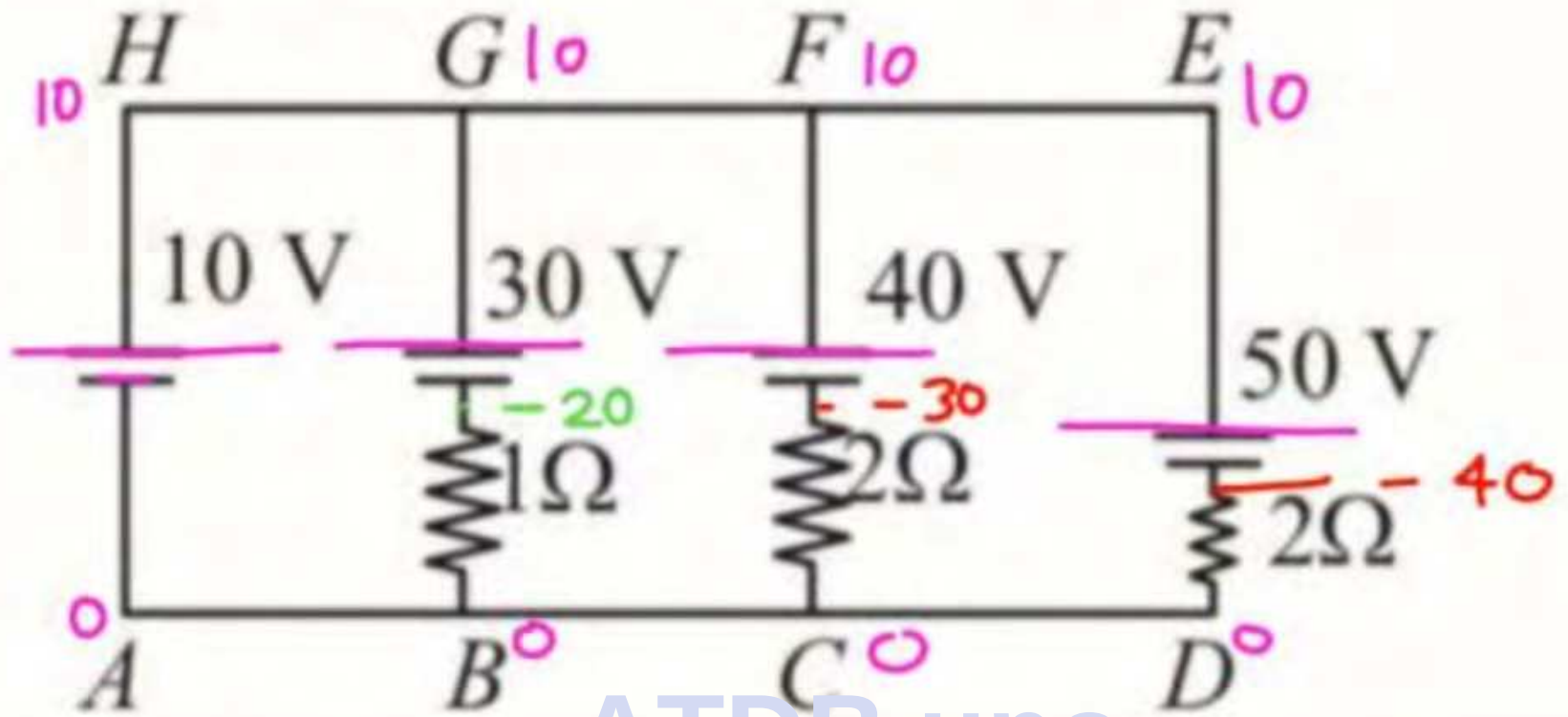
$$\frac{0 - V_1}{R_1} + 0 + \frac{V_2 - 0}{R_3} = 0$$

$$\boxed{\frac{V_1}{R_1} = \frac{V_2}{R_3}}$$

$$\frac{V_1}{R_1} = \frac{2V_1}{R_3}$$

$$R_3 = 2R_1$$

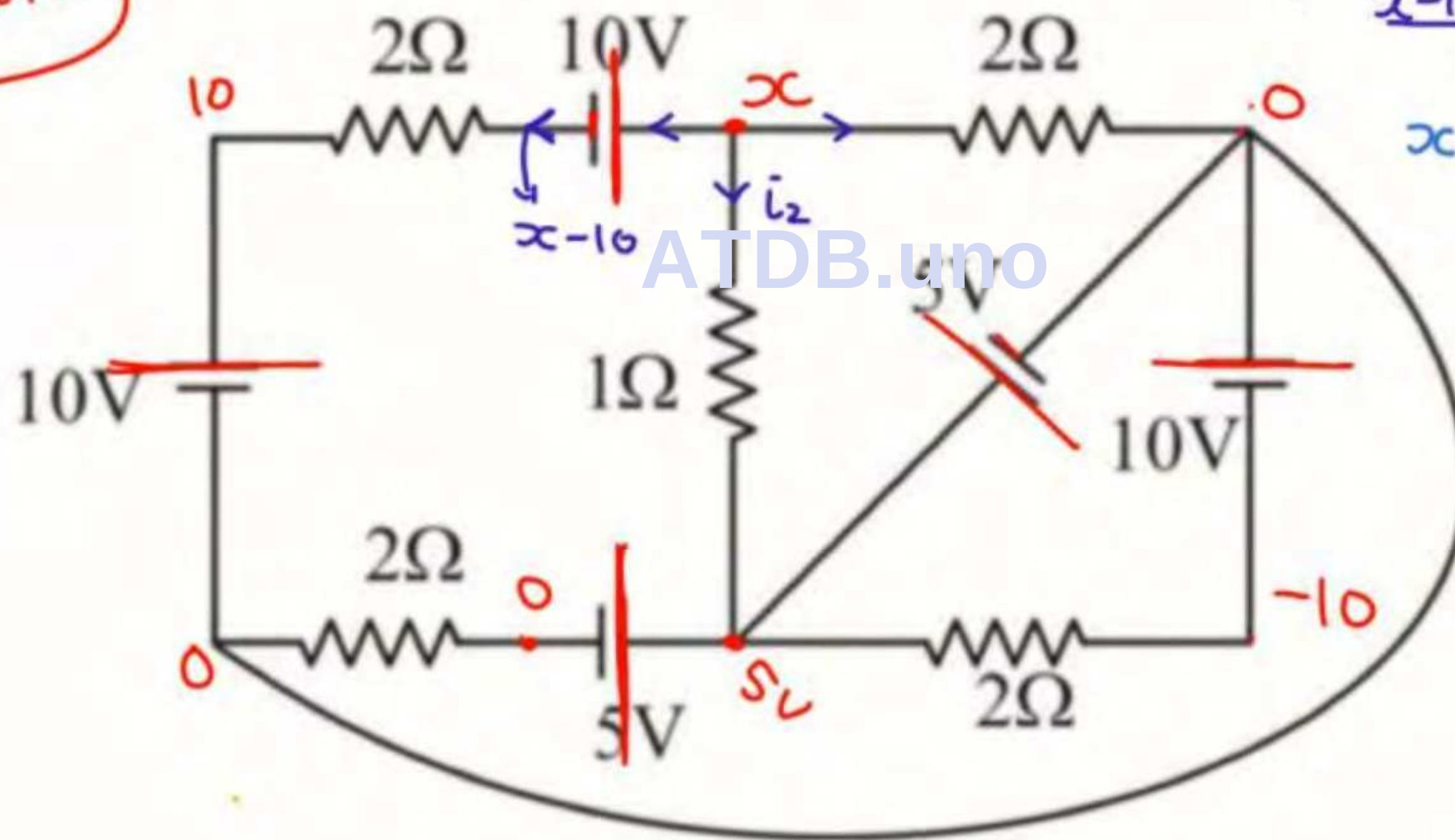
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Example 36: In the circuit diagram shown in figure find the current through the 1Ω resistor.

Class Notes



$$\frac{x-10-10}{2} + \frac{x-5}{1} + \frac{x-0}{2} = 0$$
$$x-20 + 2x-10 + x = 0$$

$$4x = 30$$

$$x = 7.5$$

$$i_2 = \frac{x-5}{1} = \frac{7.5-5}{1} = 2.5$$

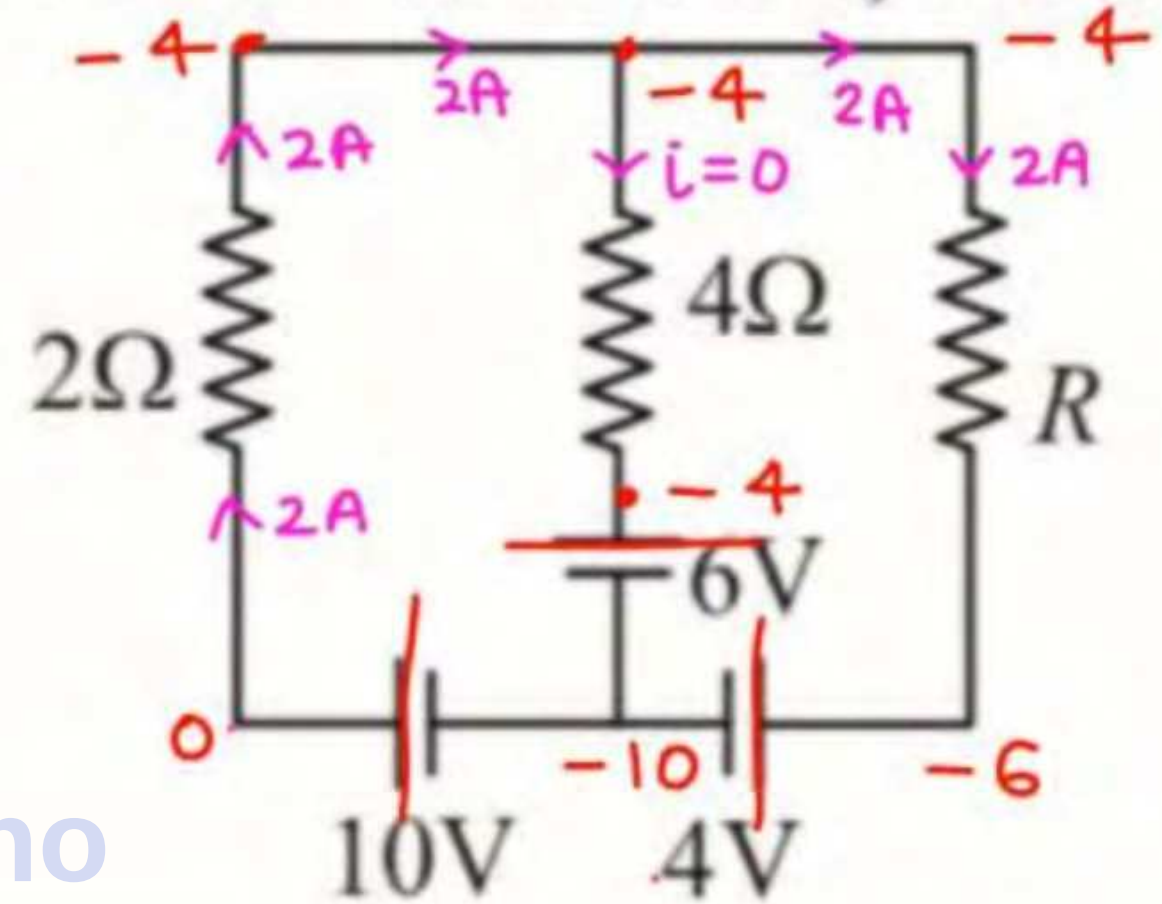
37

For what value of R in the circuit as shown, current through $4\ \Omega$ will be zero?

- (a) $1\ \Omega$
- (b) $2\ \Omega$
- (c) $3\ \Omega$
- (d) $4\ \Omega$



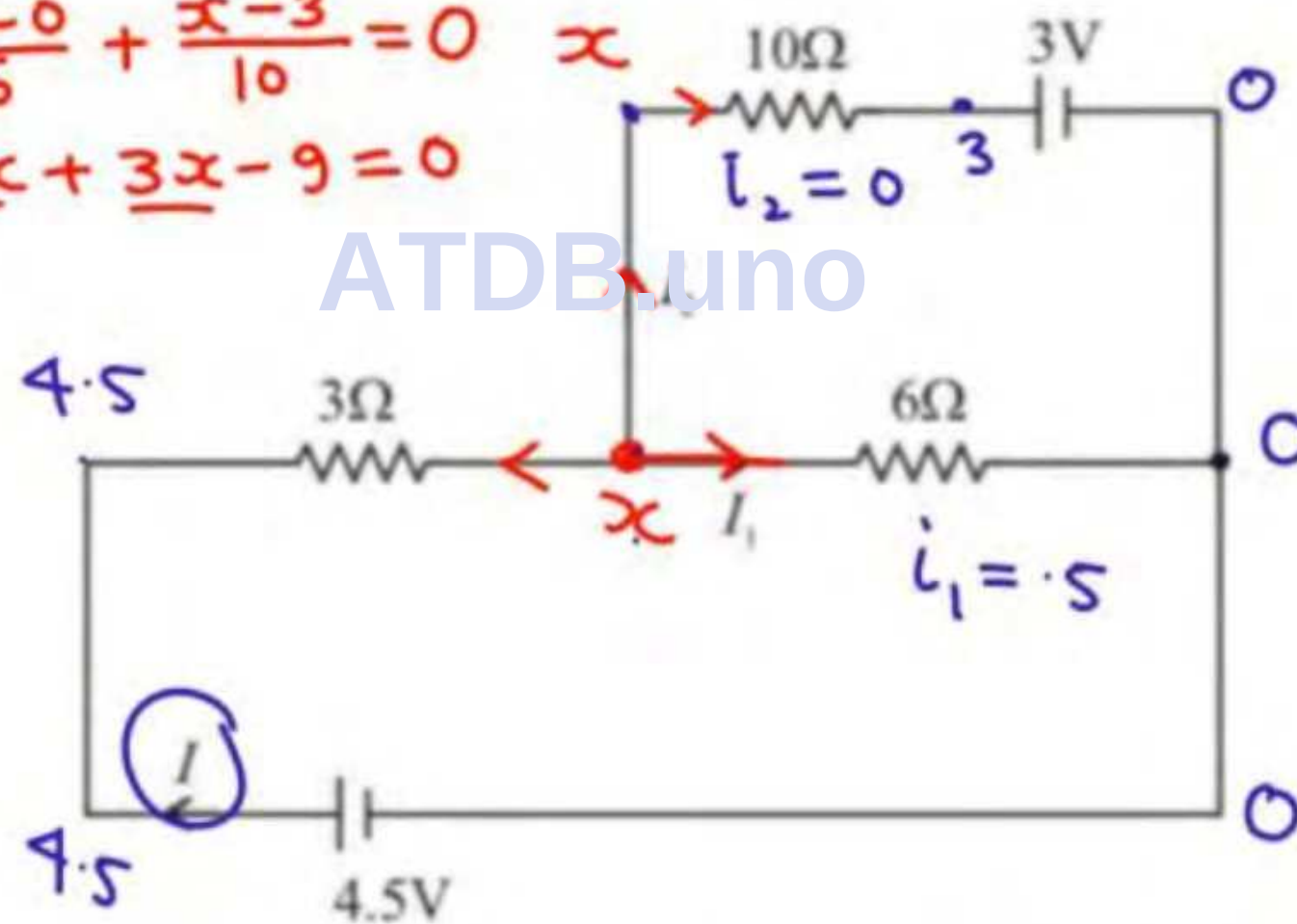
$$V = iR$$
$$2 = 2 \times R$$





- (d) $\frac{1}{2}, 0$ and $\frac{1}{2}$

$x = 3$

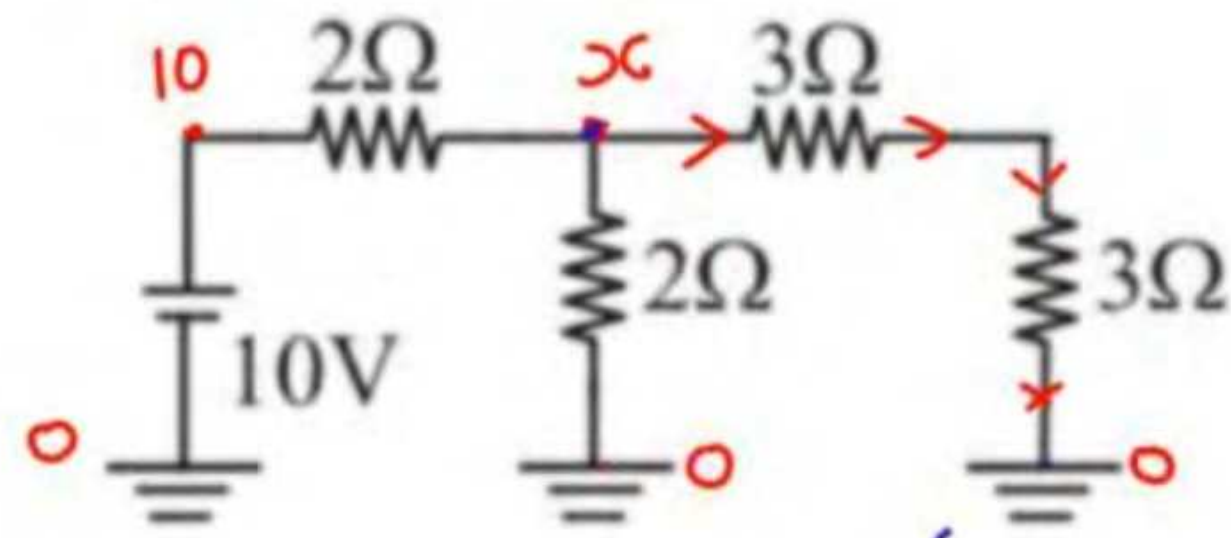


(JEE Lakshya Physics M-1)

39. Current in $3\ \Omega$ resistance is

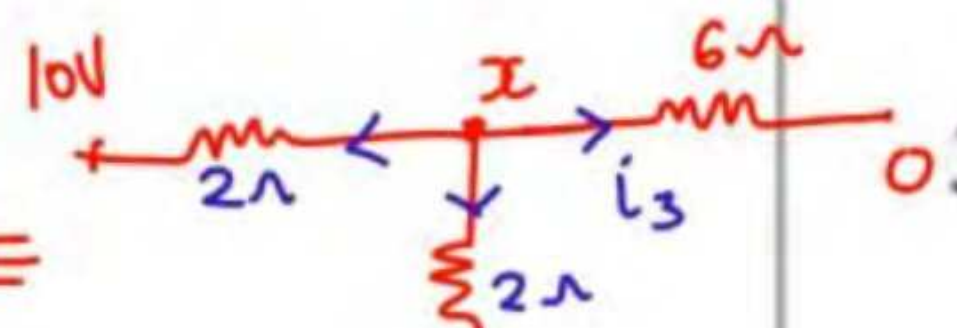
$$i_3 = \frac{\frac{30}{7} - 0}{6}$$

(a) 1 A



(b) $\frac{1}{7}$ A

(c) $\frac{5}{7}$ A



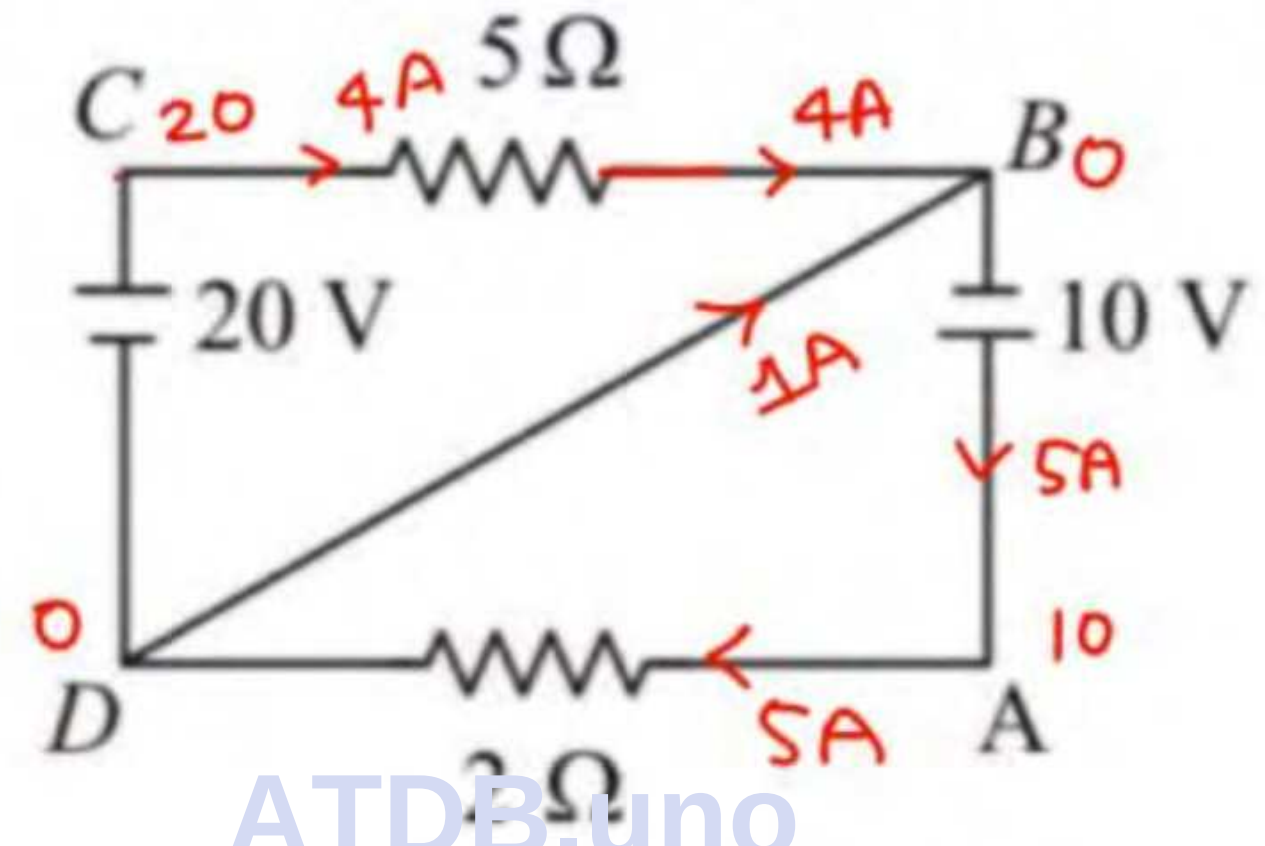
$$\frac{x-10}{2} + \frac{x-0}{2} + \frac{x-0}{6} = 0$$

(d) $\frac{15}{7}$ A

$$3x - 36 + 3x + x = 0$$

$$x = \left(\frac{36}{7}\right)$$

Find out the current in the wire BD shown in the figure.

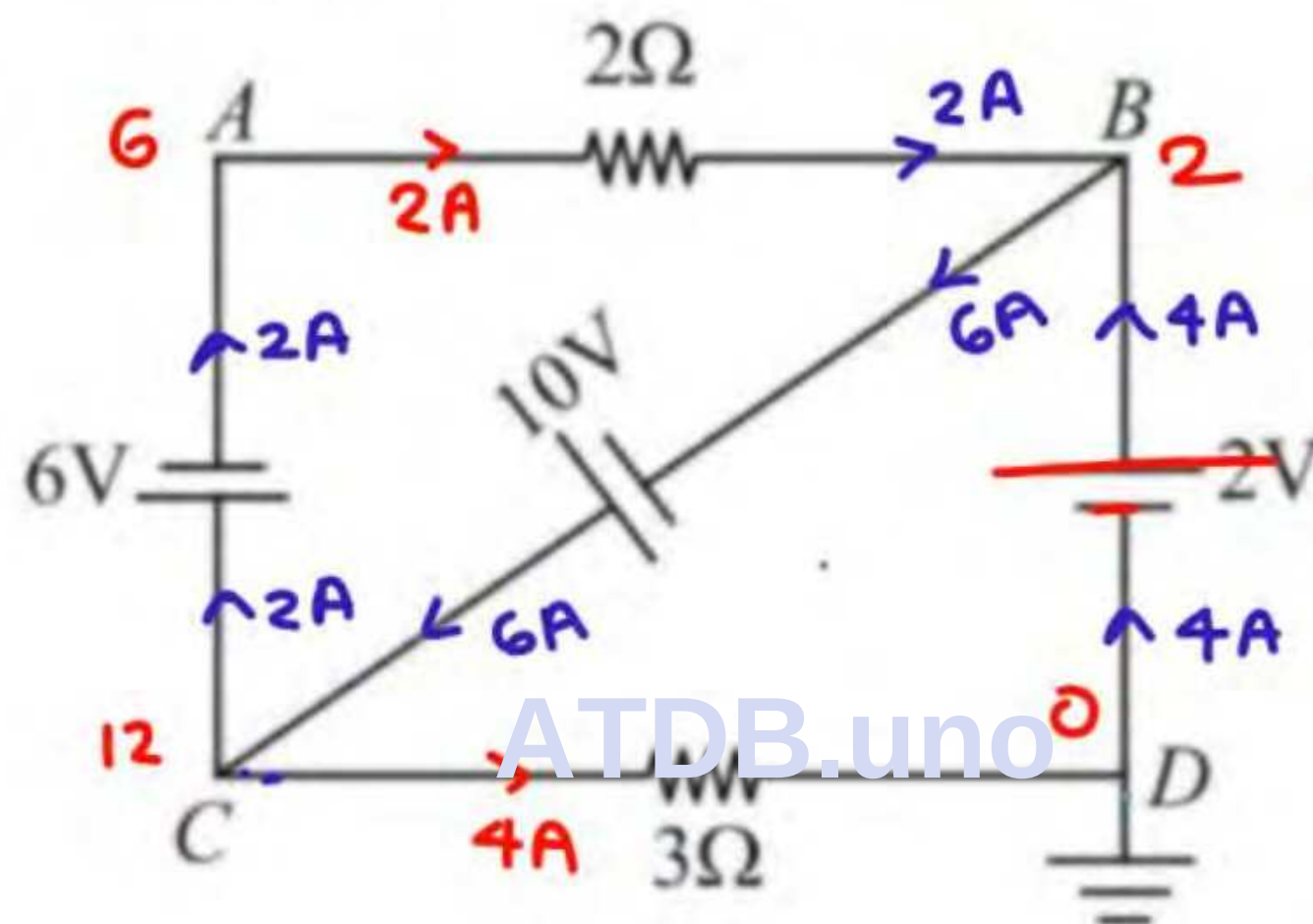


- (a) 1A
- (c) 3A

- (b) 2A
- (d) 4A

(JEE Lakshya Physics M-1)

41 In the shown circuit



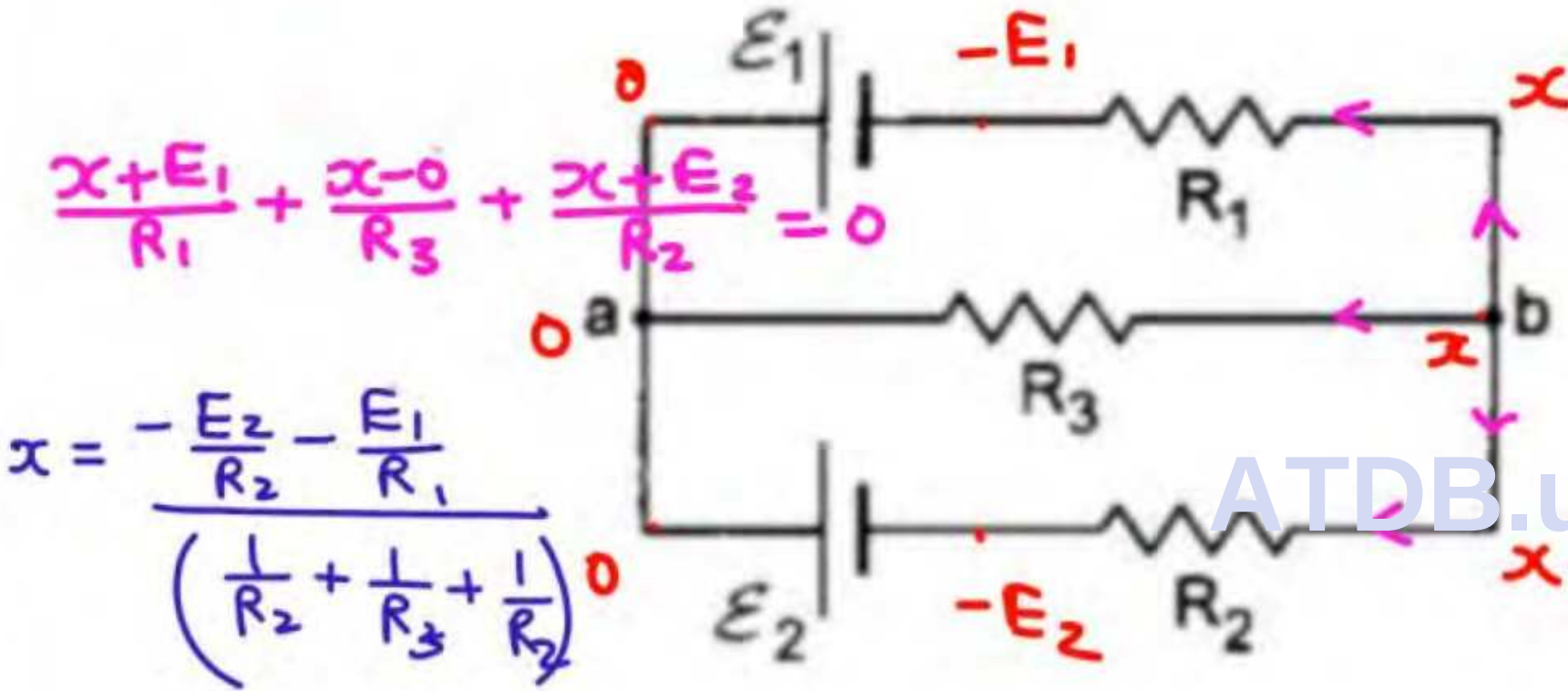
- ✓ (a) current passing through $2\ \Omega$ resistance is 2 A
- ✓ (b) current passing through $3\ \Omega$ resistance is 4 A
- ✓ (c) current in the wire between D to earth is zero
- ✗ (d) potential of point A is 10 V

(JEE Lakshya Physics M-1)

36. Find the potential difference $V_a - V_b$ in the circuits shown in figure (32-E12).

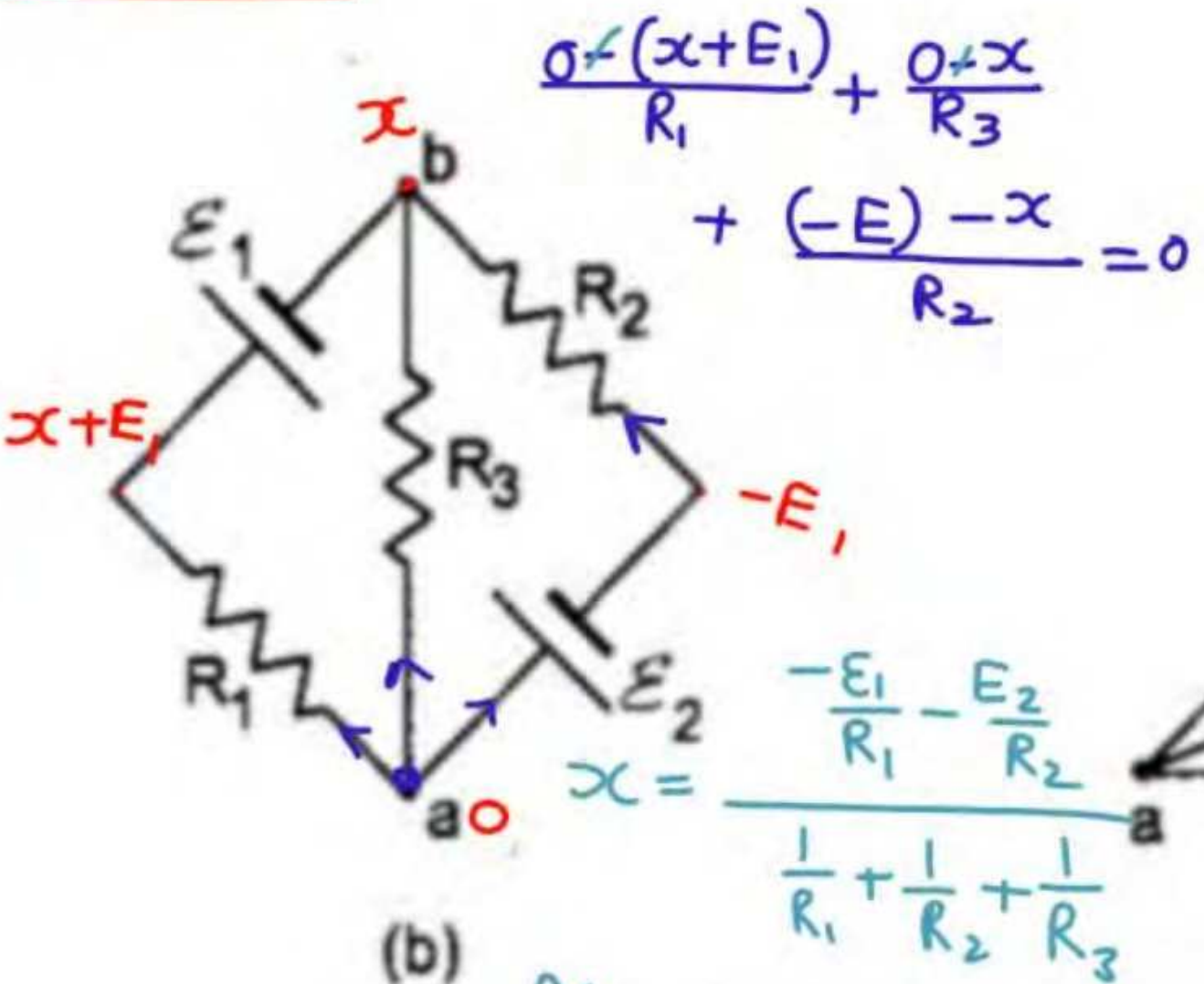
42

0-x Ans



$$x = \frac{-\frac{E_2}{R_2} - \frac{E_1}{R_1}}{\left(\frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_2}\right)}$$

(a)



(b)

Ans 0-x

38. Find the current through the $10\ \Omega$ resistor shown in figure (32-E14).

$$\frac{x-4.5}{3} + \frac{x-3}{10} + \frac{x-0}{6} = 0$$

$$10x - 45 + 3x - 9 + 5x = 0$$

$$18x = 54$$

$$x = 3$$

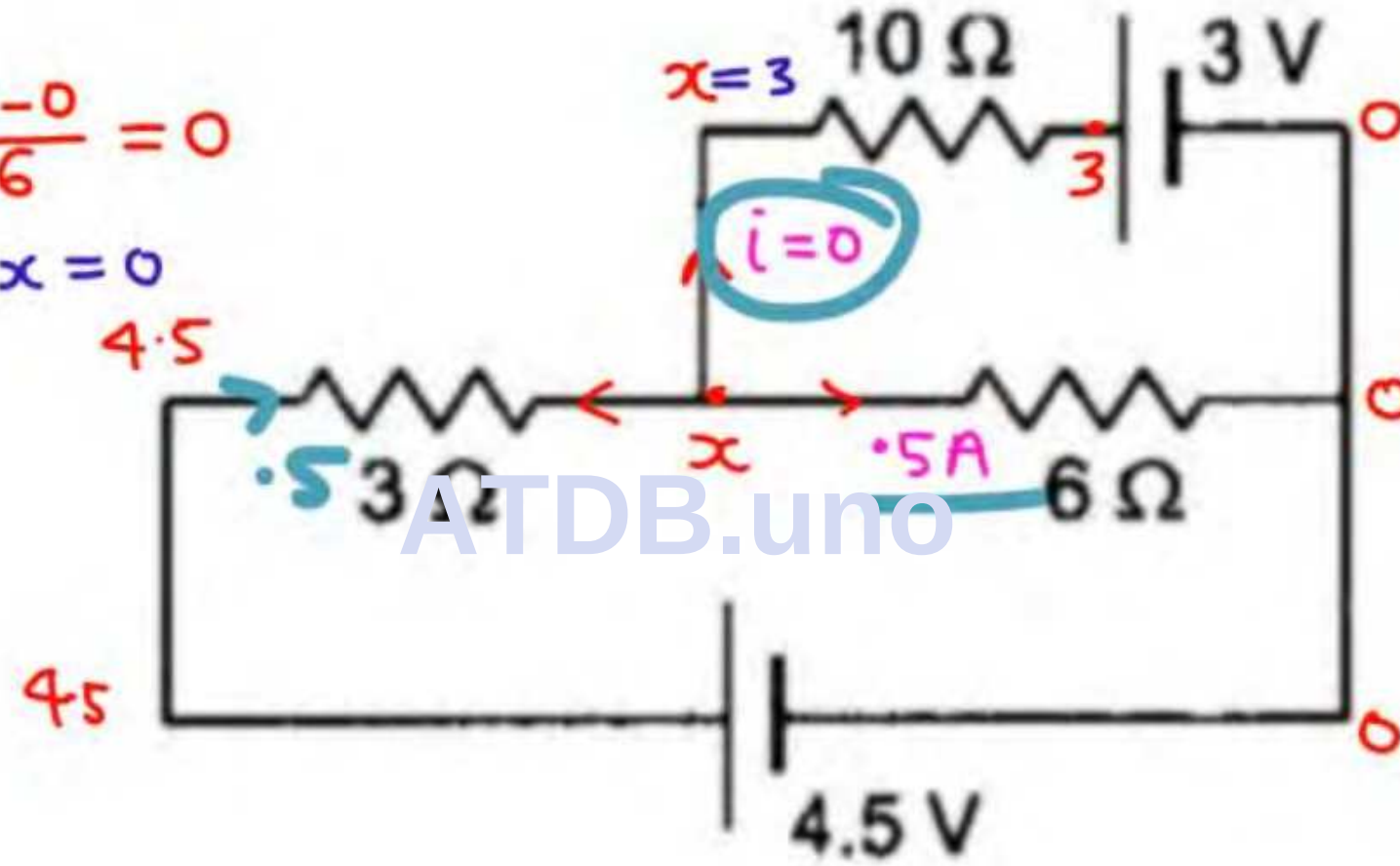


Figure 32-E14

44 HCV

In the circuit shown in figure (32-E13), $\mathcal{E}_1 = 3\text{ V}$, $\mathcal{E}_2 = 2\text{ V}$, $\mathcal{E}_3 = 1\text{ V}$ and $r_1 = r_2 = r_3 = 1\ \Omega$. Find the potential difference between the points A and B and the current through each branch.

$$0 = \frac{x-3}{1} + \frac{x-2}{1} + \frac{x-1}{1}$$

$x = 2$

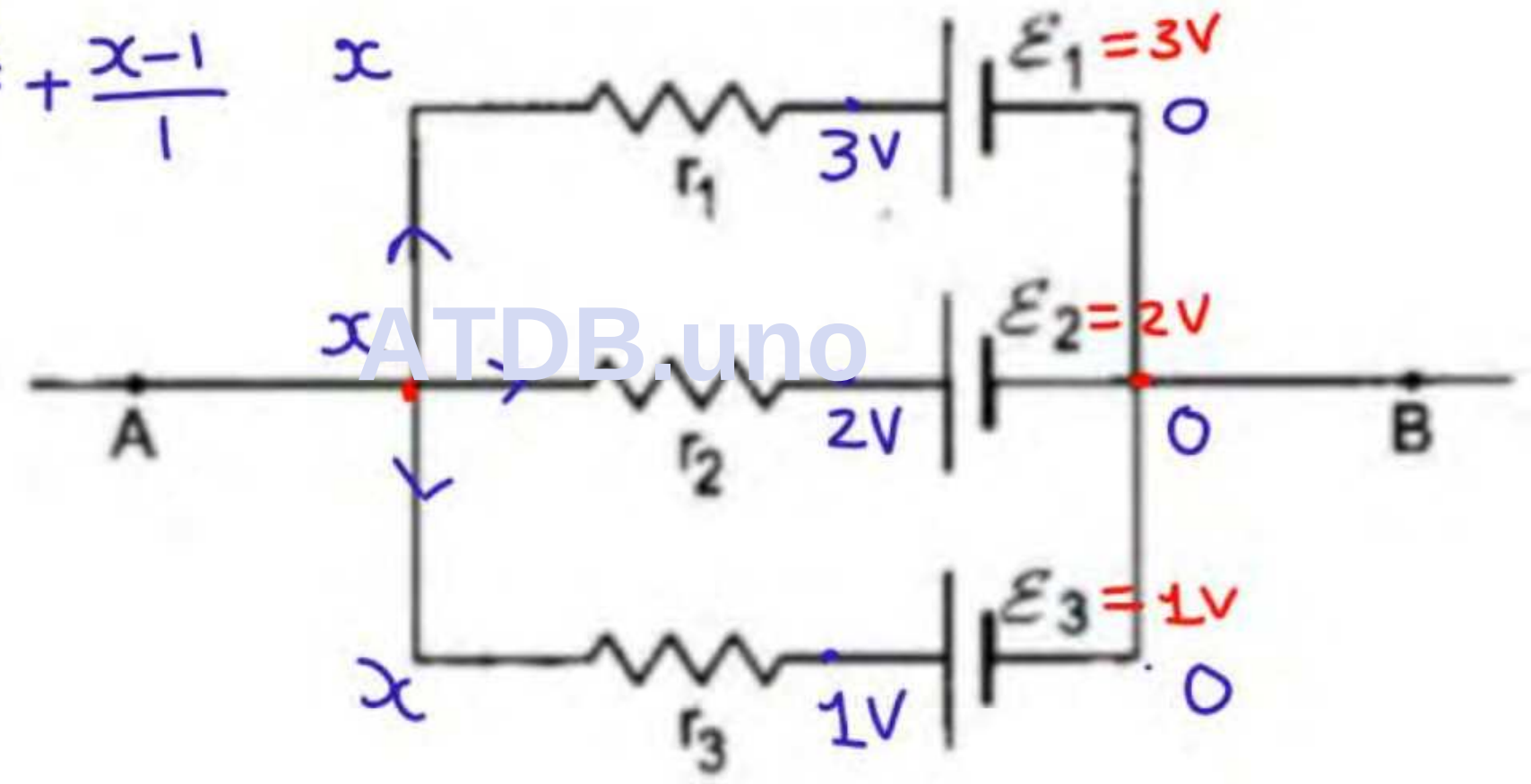
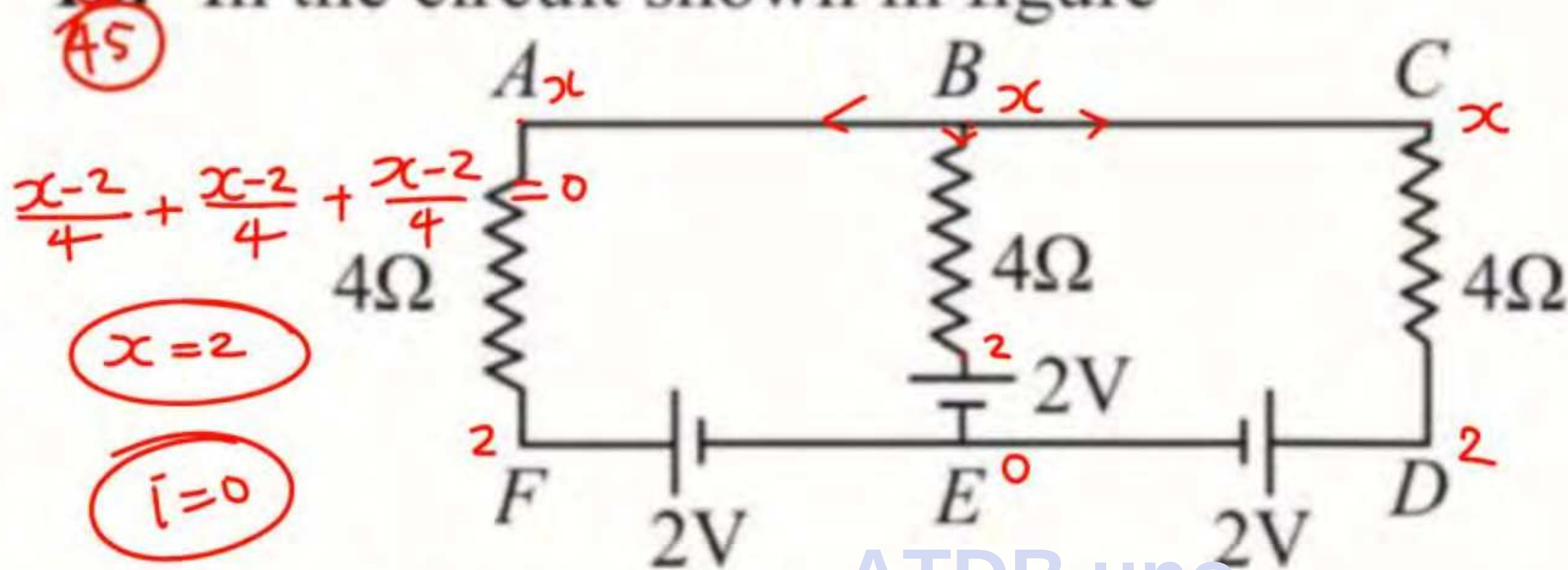
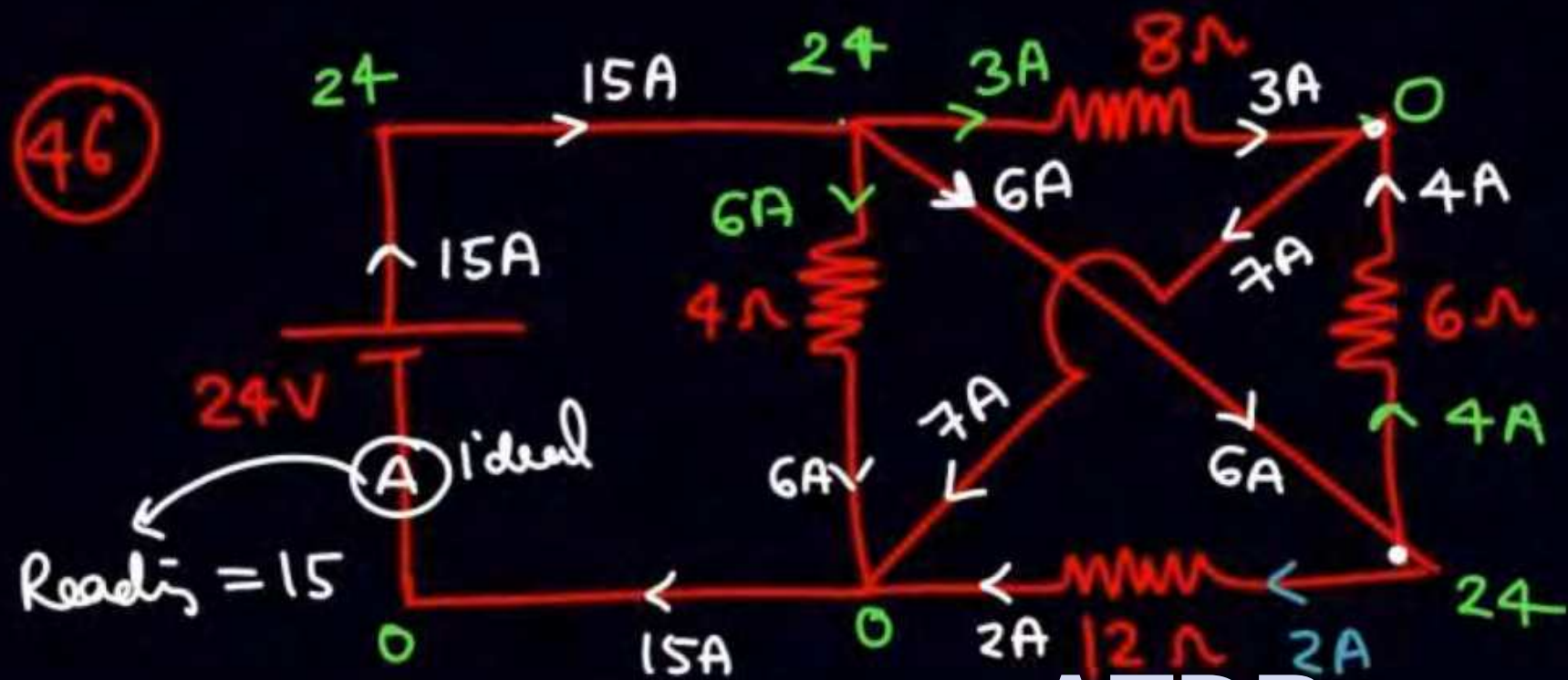


Figure 32-E13

10. In the circuit shown in figure



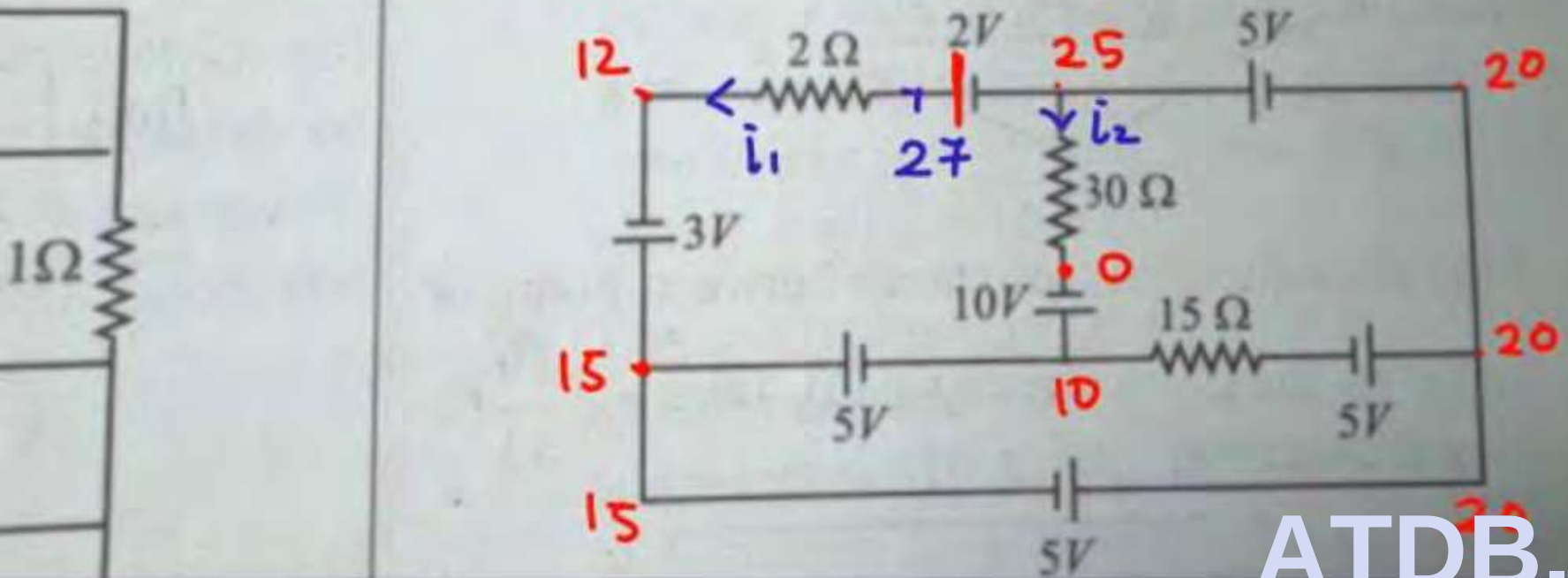
- (a) Current in wire AF is 1A ~~X~~
- (b) Current in wire CD is 1A ~~X~~
- (c) Current in wire BE is 2A ~~X~~
- ☒ (d) None of these



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1 μF capacitor
(in μC).

47. In the circuit shown, current through the resistance $2\ \Omega$ is i_1 and current through the resistance $30\ \Omega$ is i_2 . Find the ratio i_1 / i_2 .



$$i_1 = \frac{15}{2}$$
$$i_2 = \frac{25}{30}$$

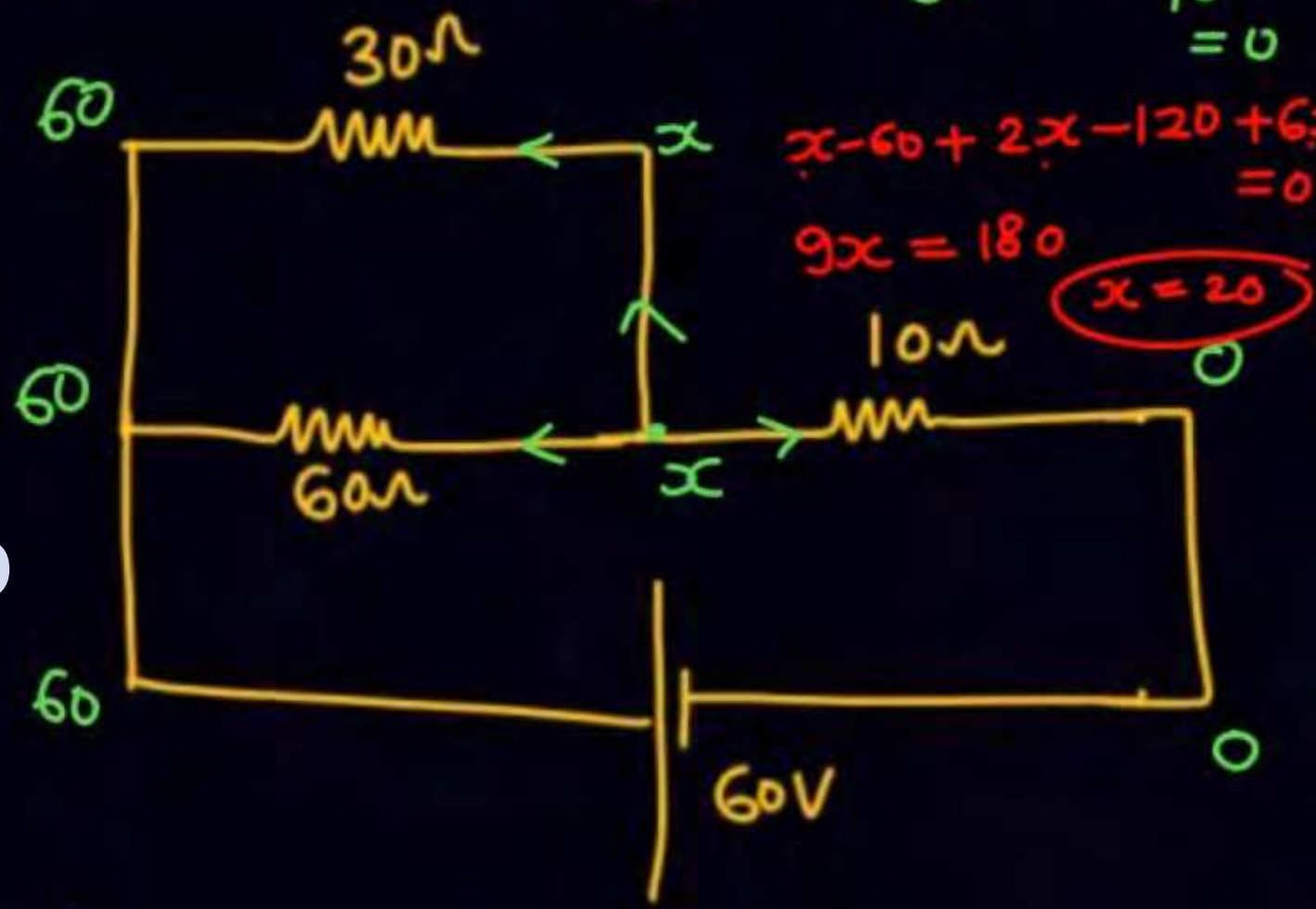
$$\frac{i_1}{i_2} = \frac{\frac{15}{2} \times 30}{2 \times \frac{25}{5}} = \frac{90}{10} = 9$$

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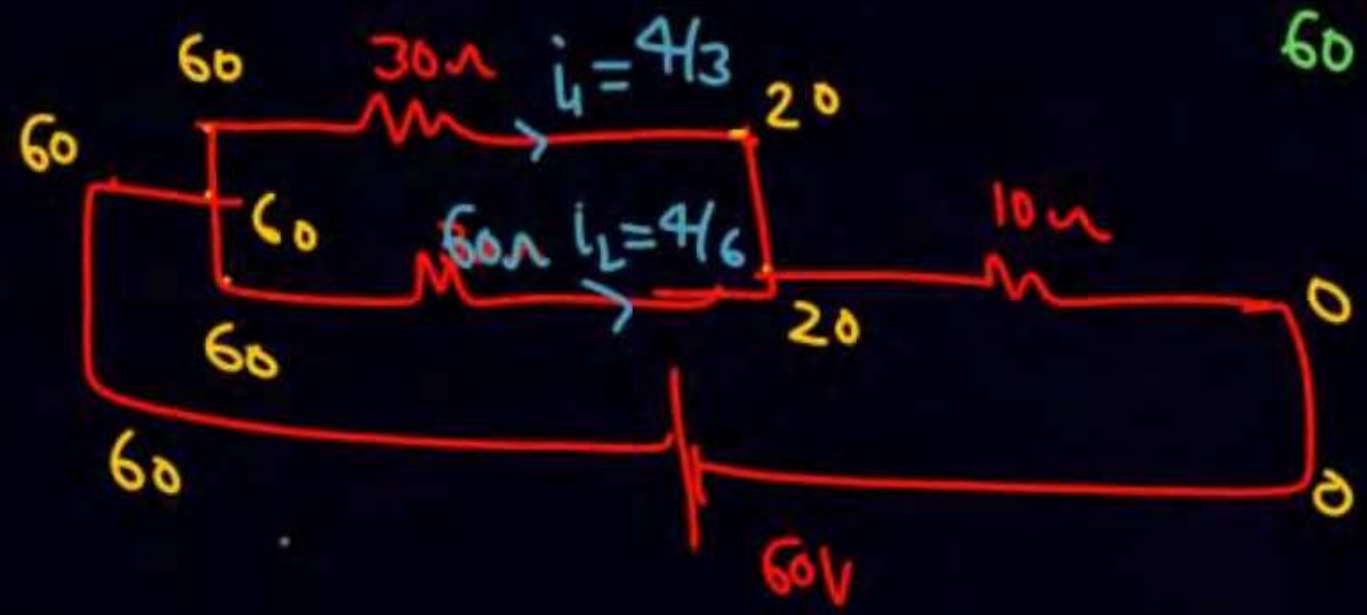


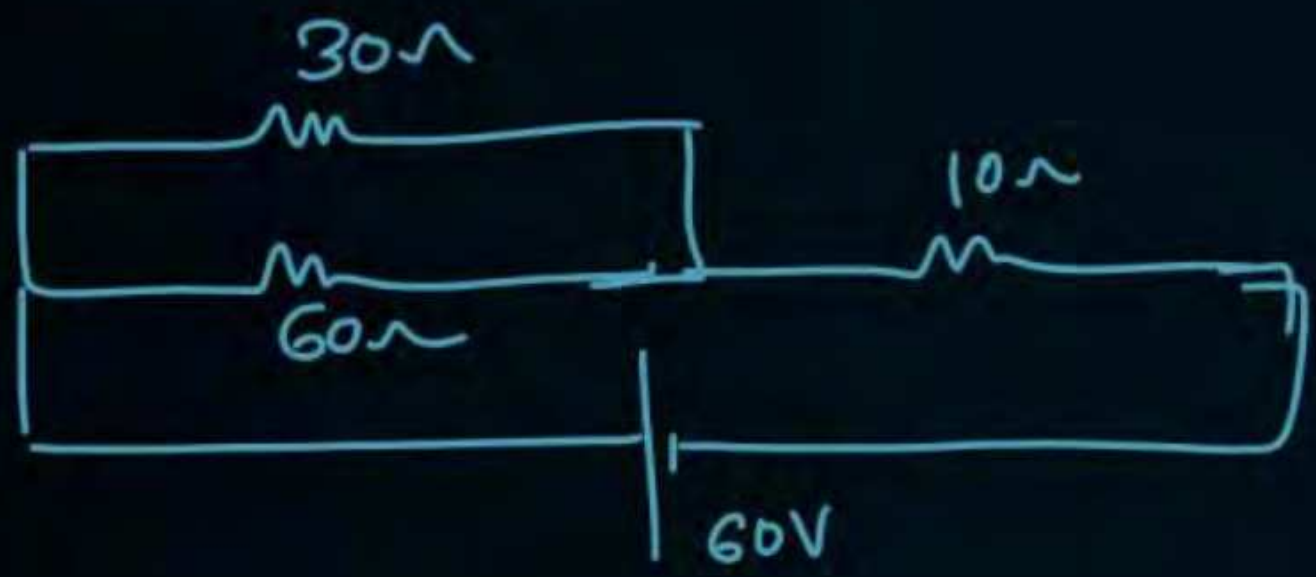
$$\frac{x-60}{60} + \frac{x-60}{30} + \frac{x-0}{10} = 0$$

$$x-60 + 2x-120 + 60 = 0$$

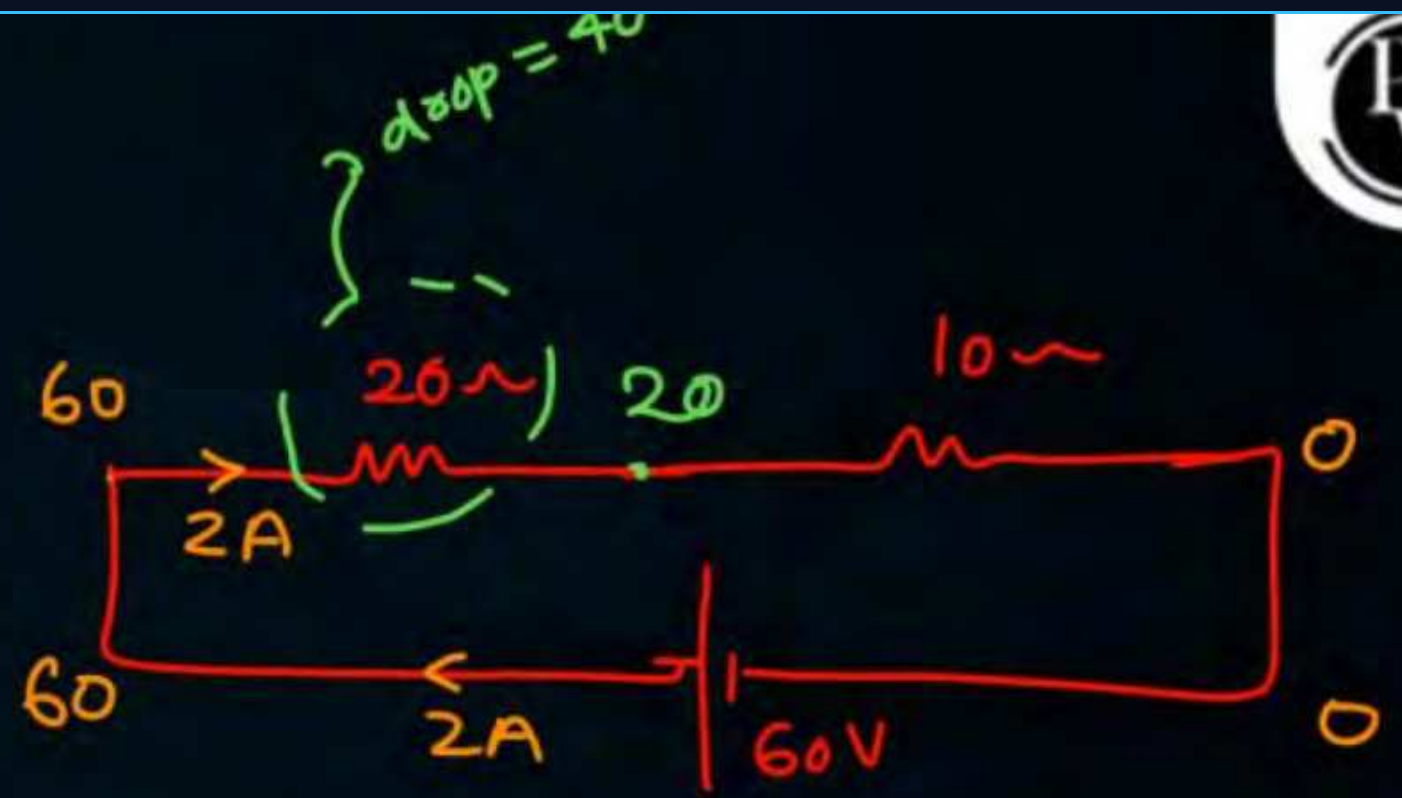
$$9x = 180$$

$$x = 20$$





=



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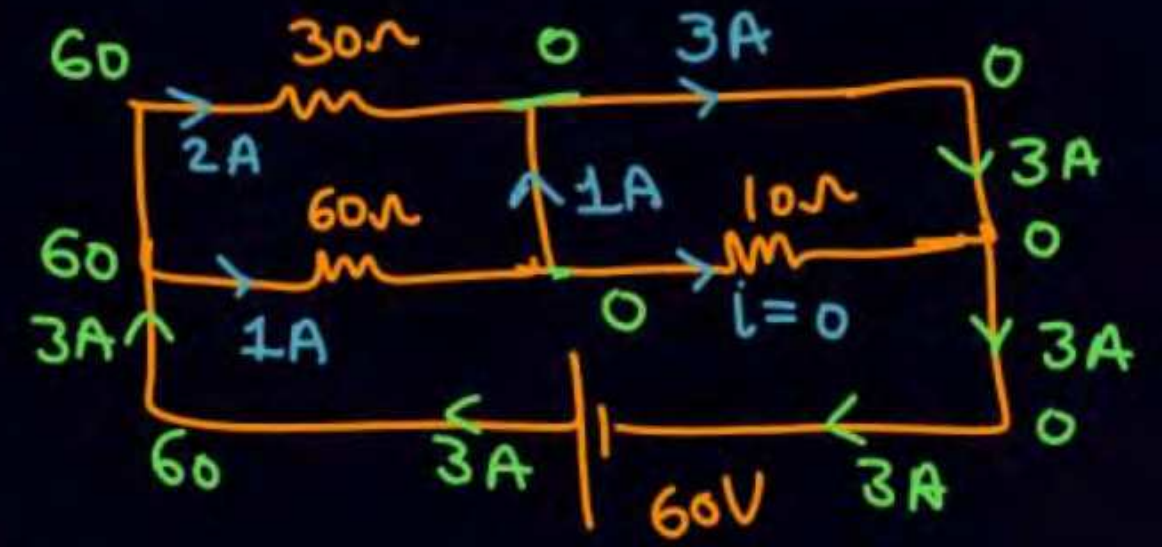


50

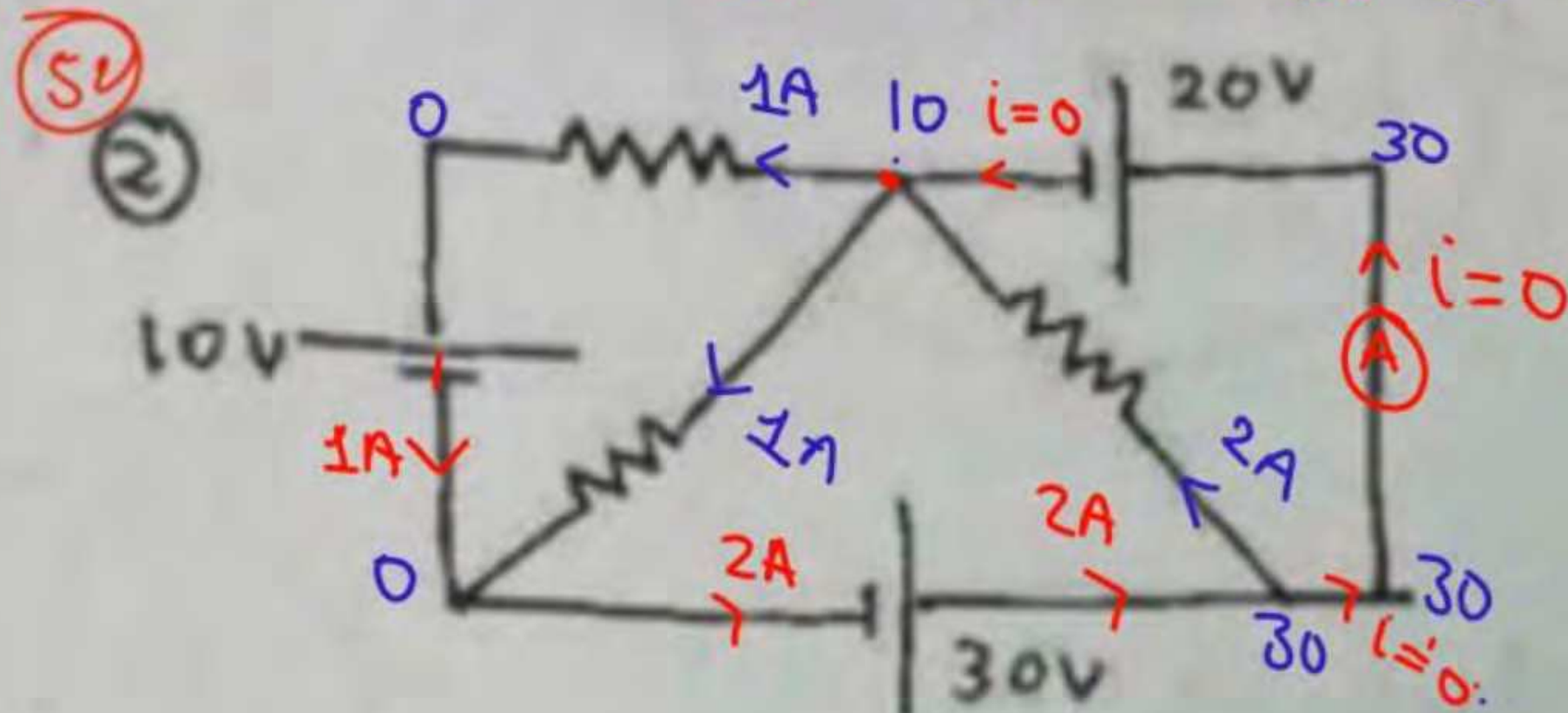
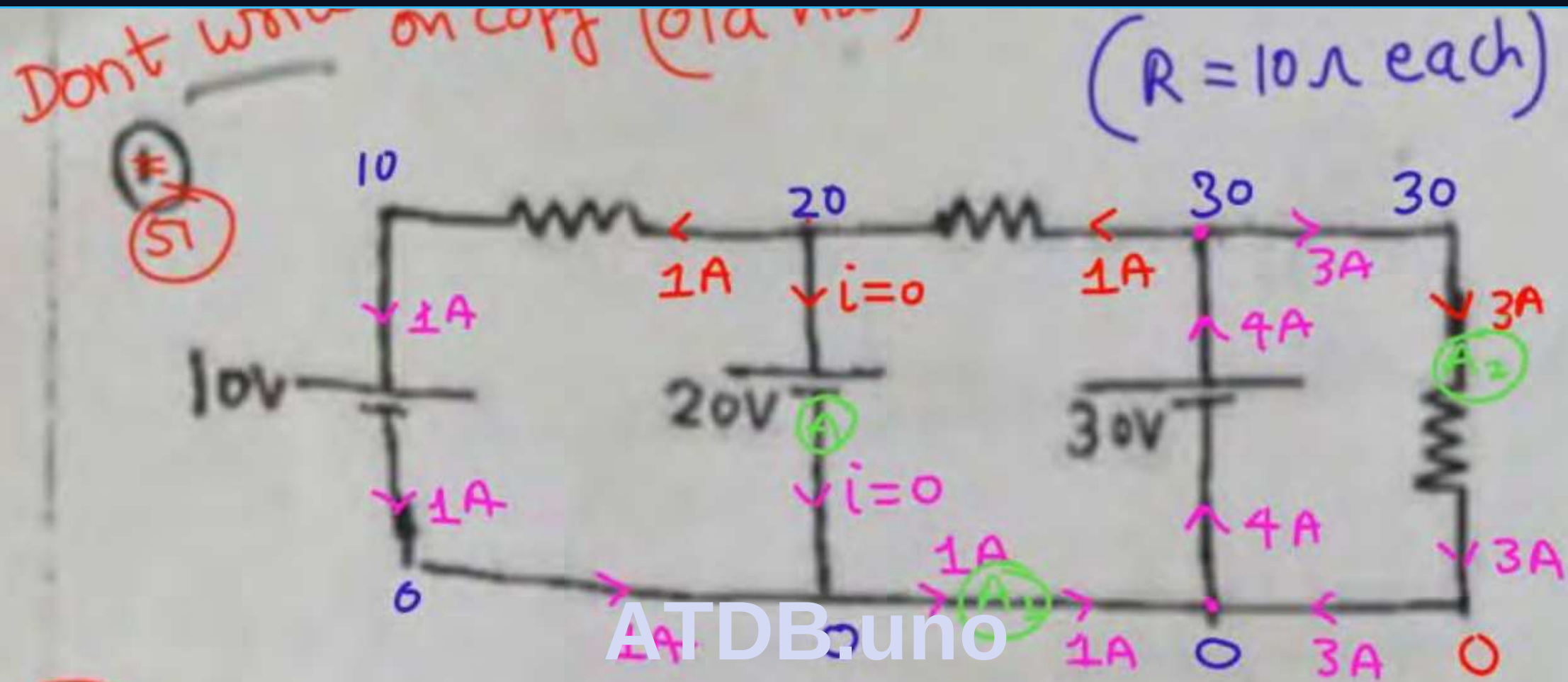


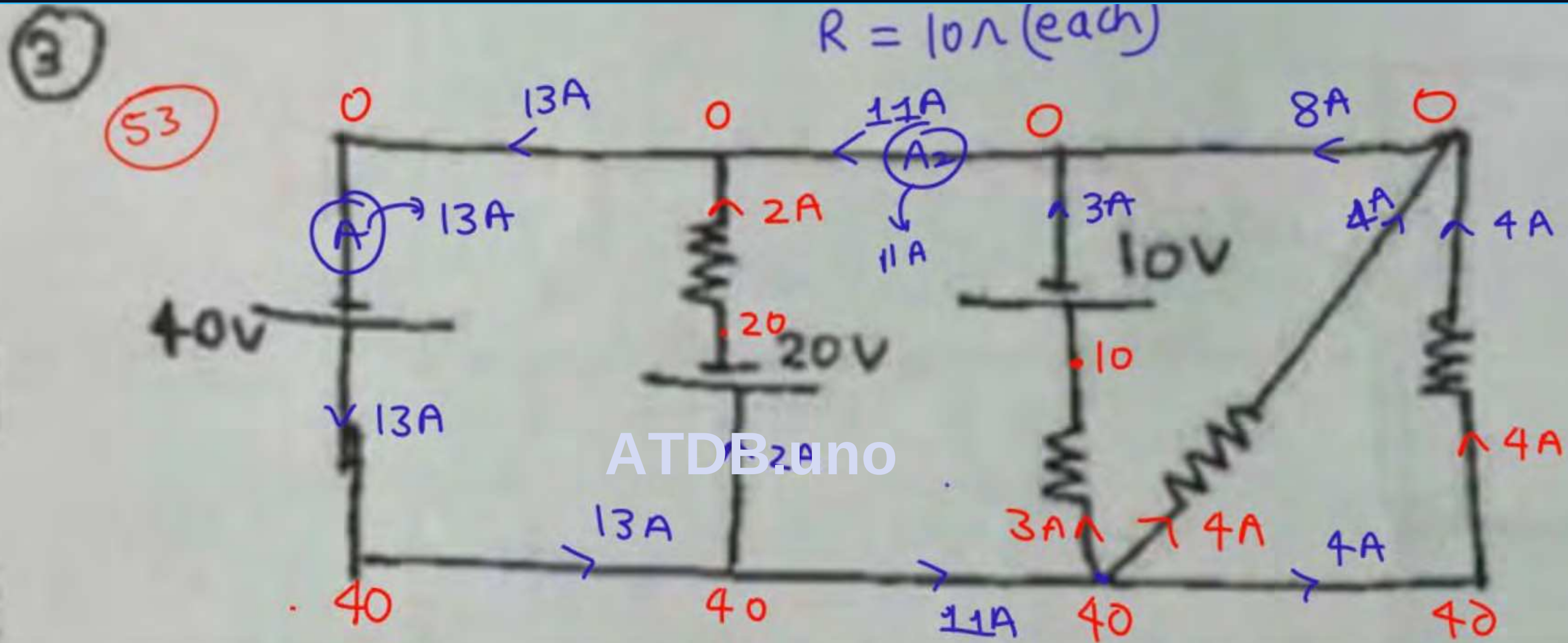
$$i_1 = \frac{60}{30+60} \times 2 = \frac{120}{90} = \frac{4}{3}$$

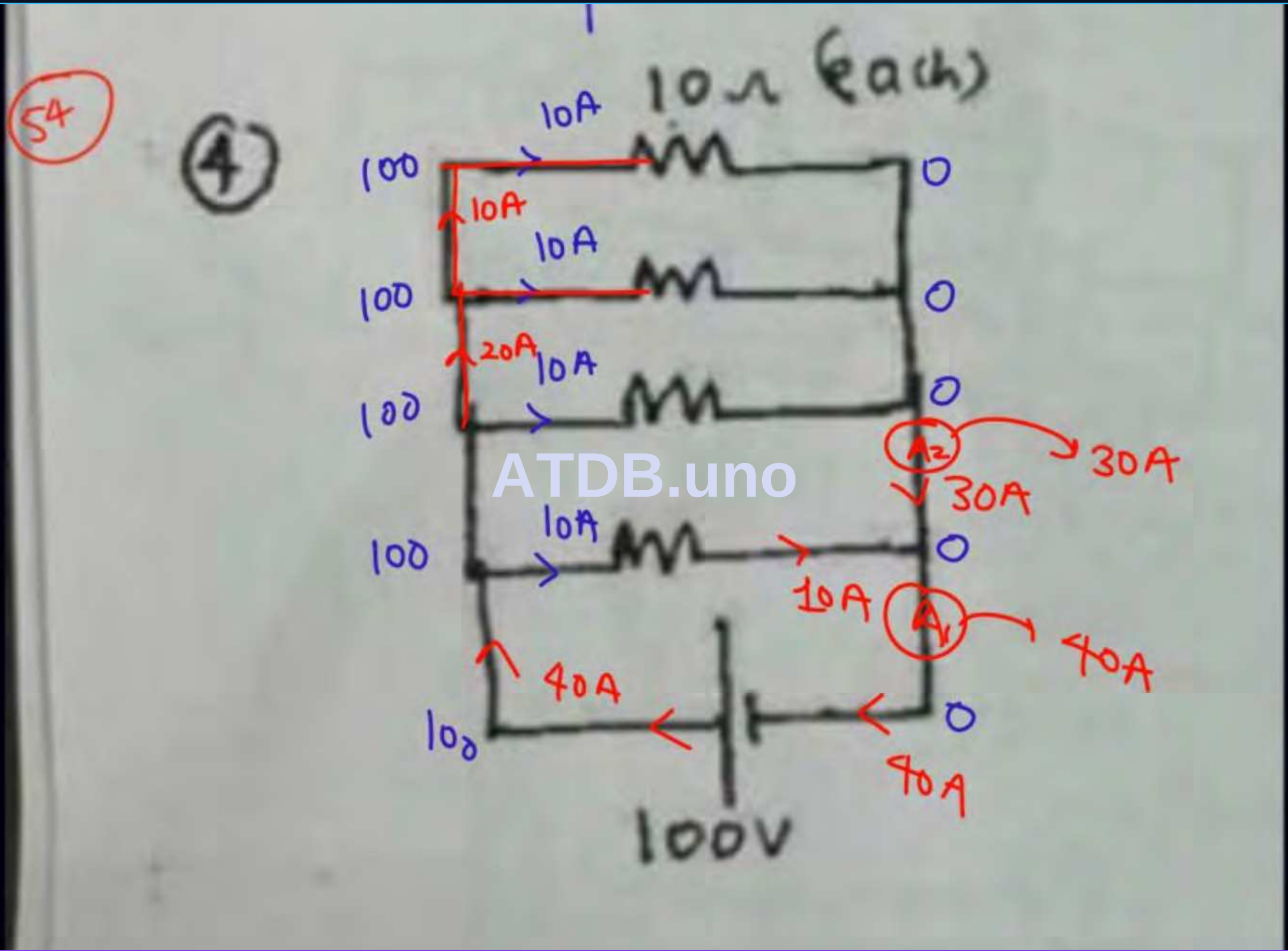
Find ratio of current through 30Ω before switch close to after switch close

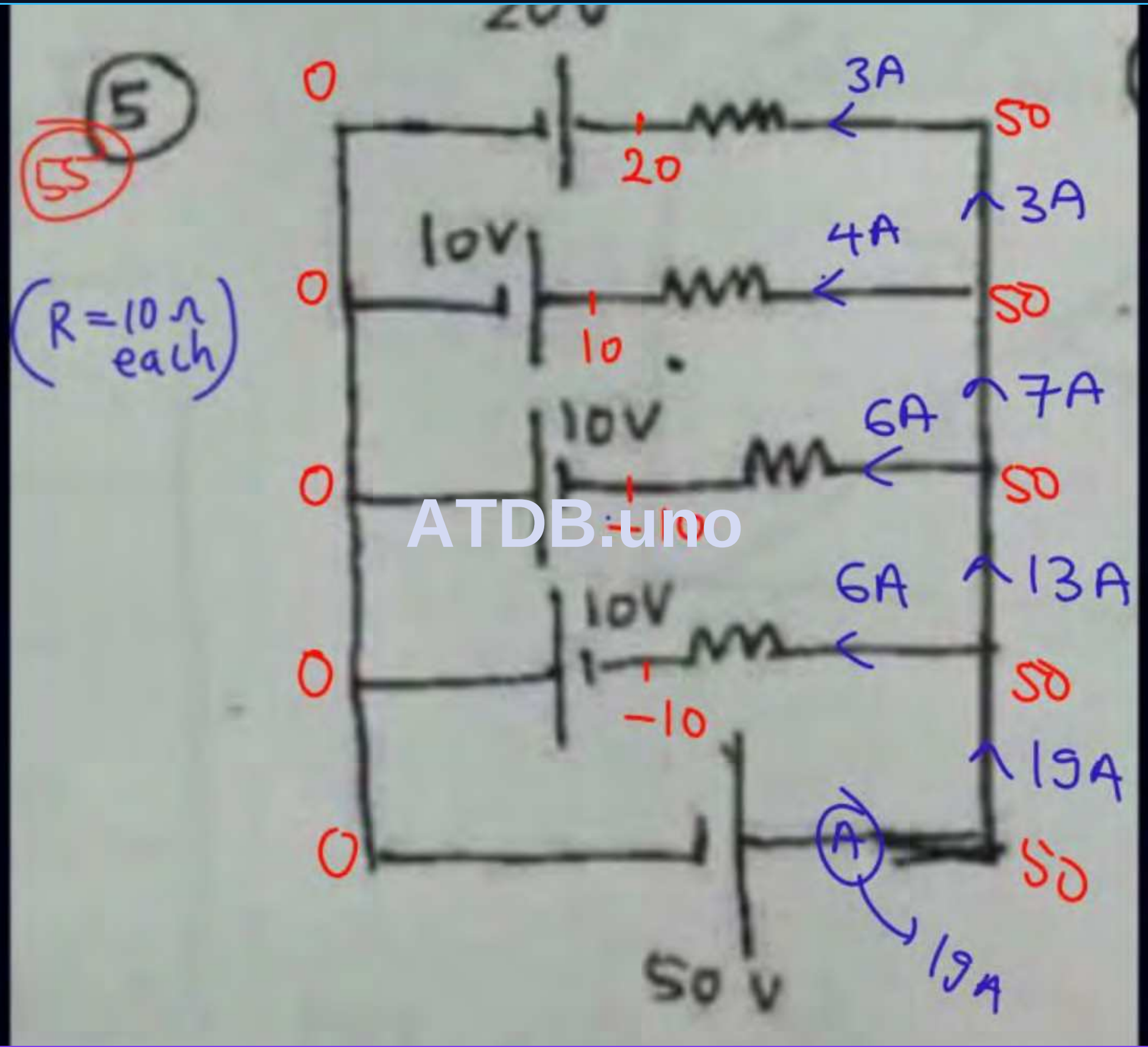


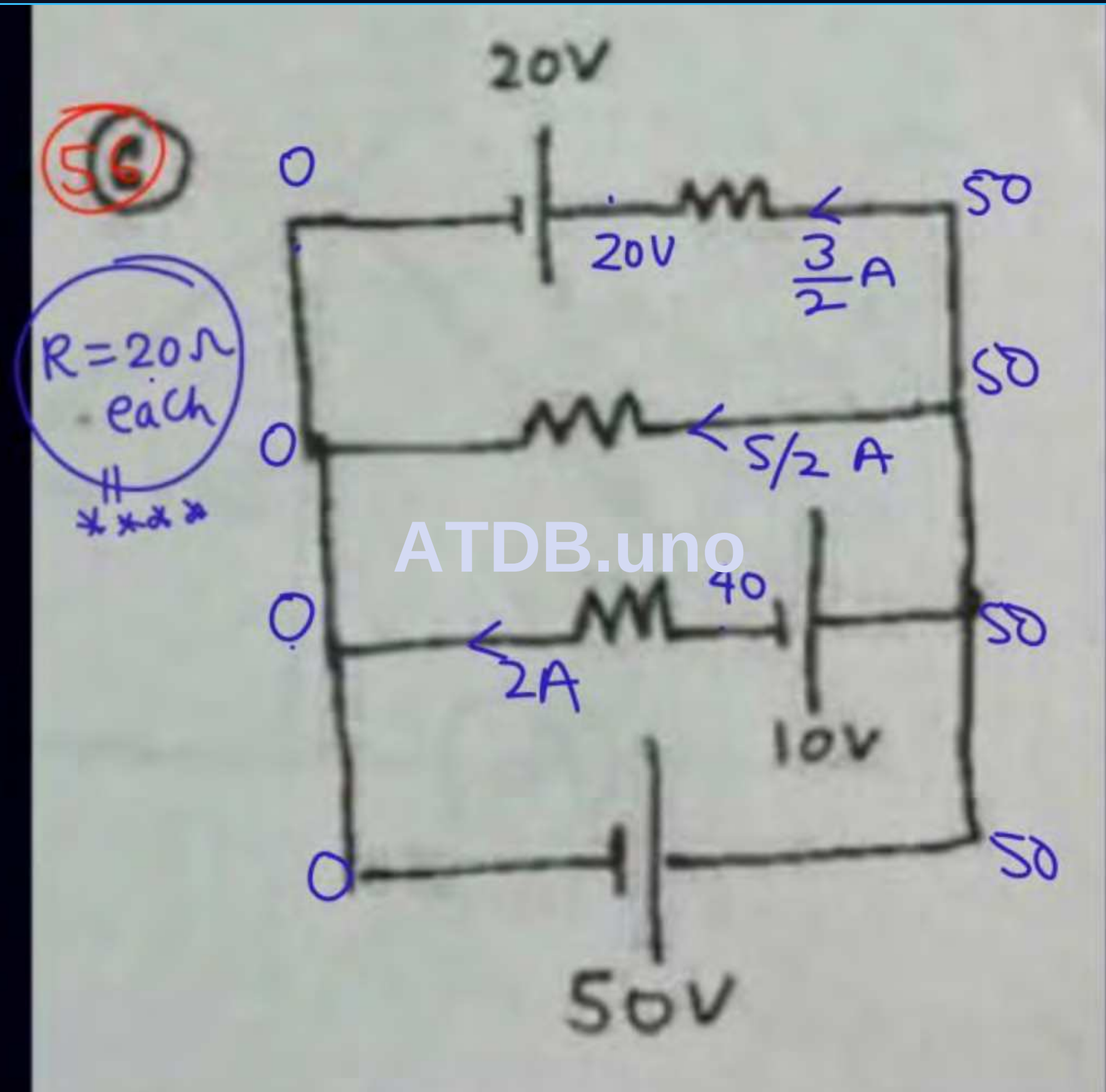
Ans $\frac{(i_1)_i}{(i_1)_f} = \frac{4/3}{2} = \frac{4}{6}$





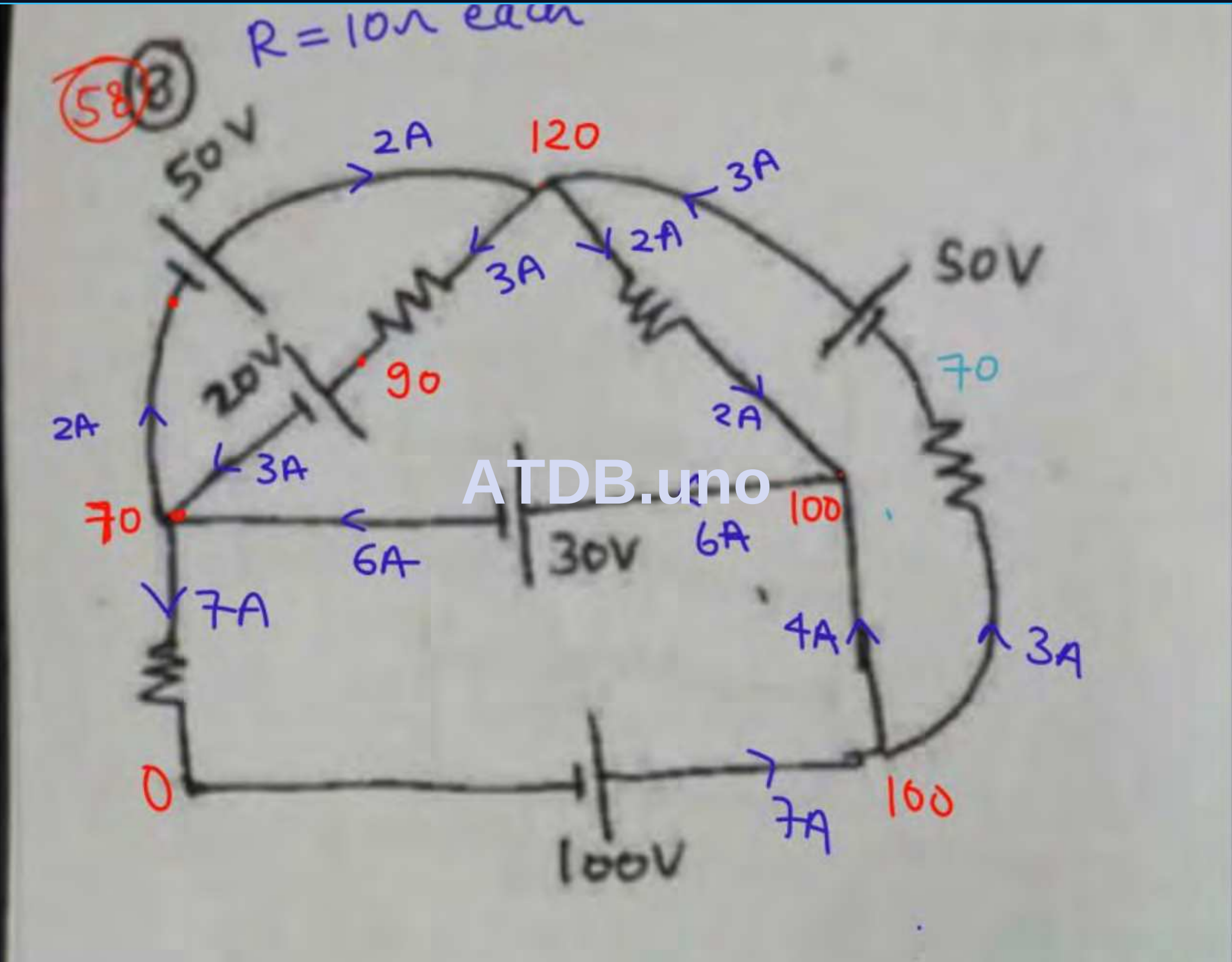


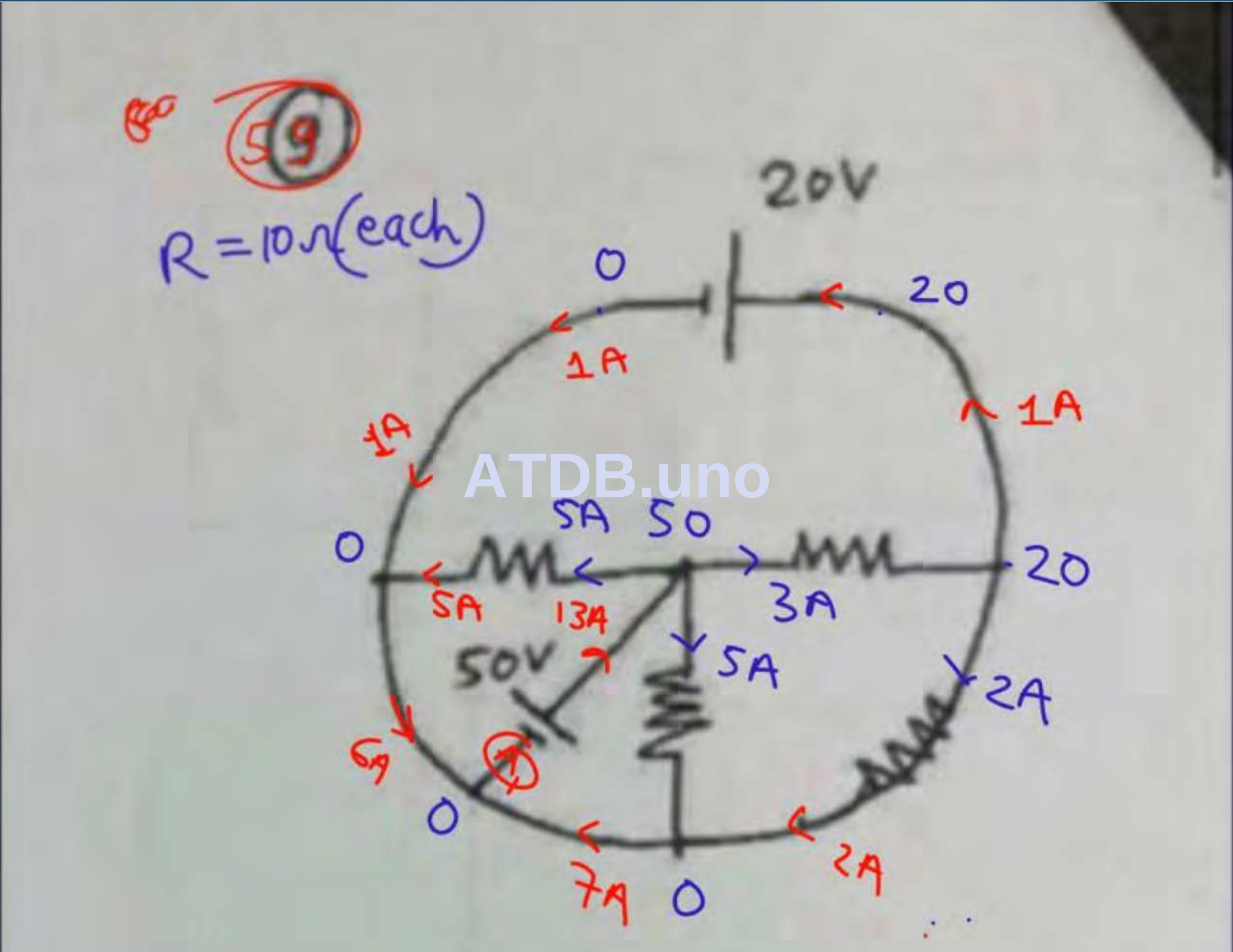


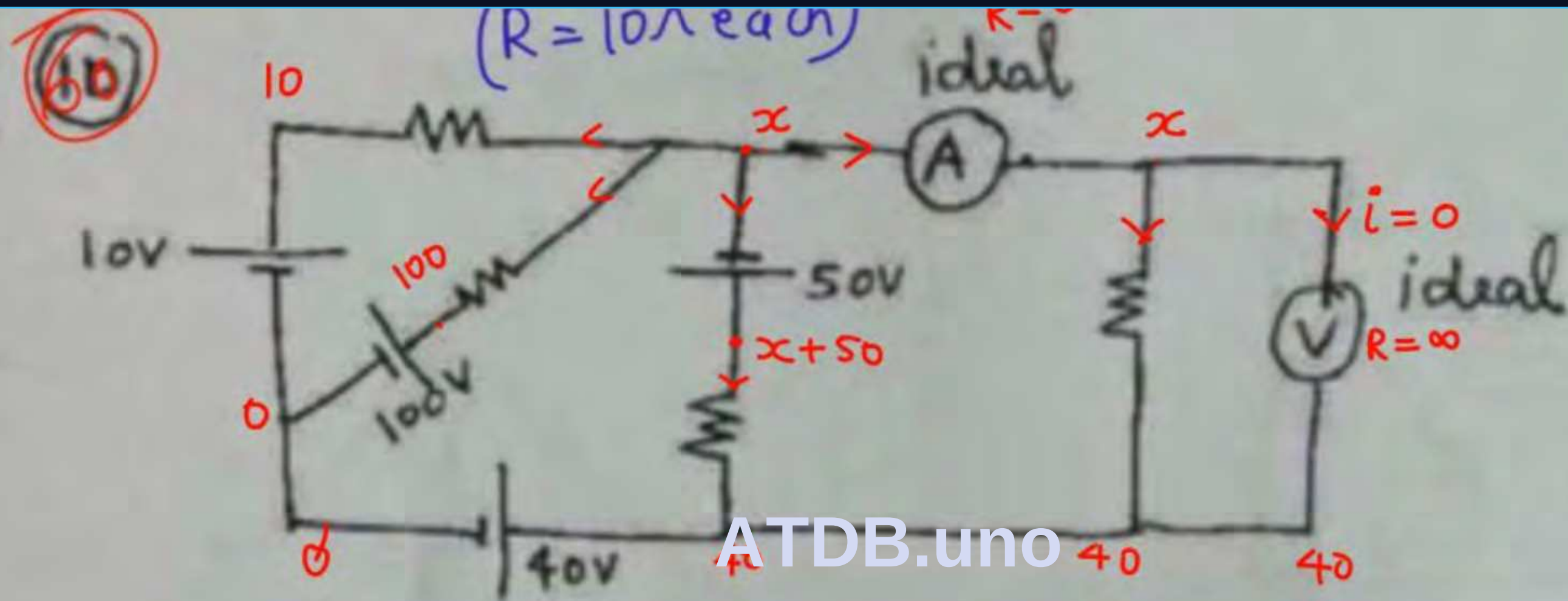




Reading of $A_1 = 4A$





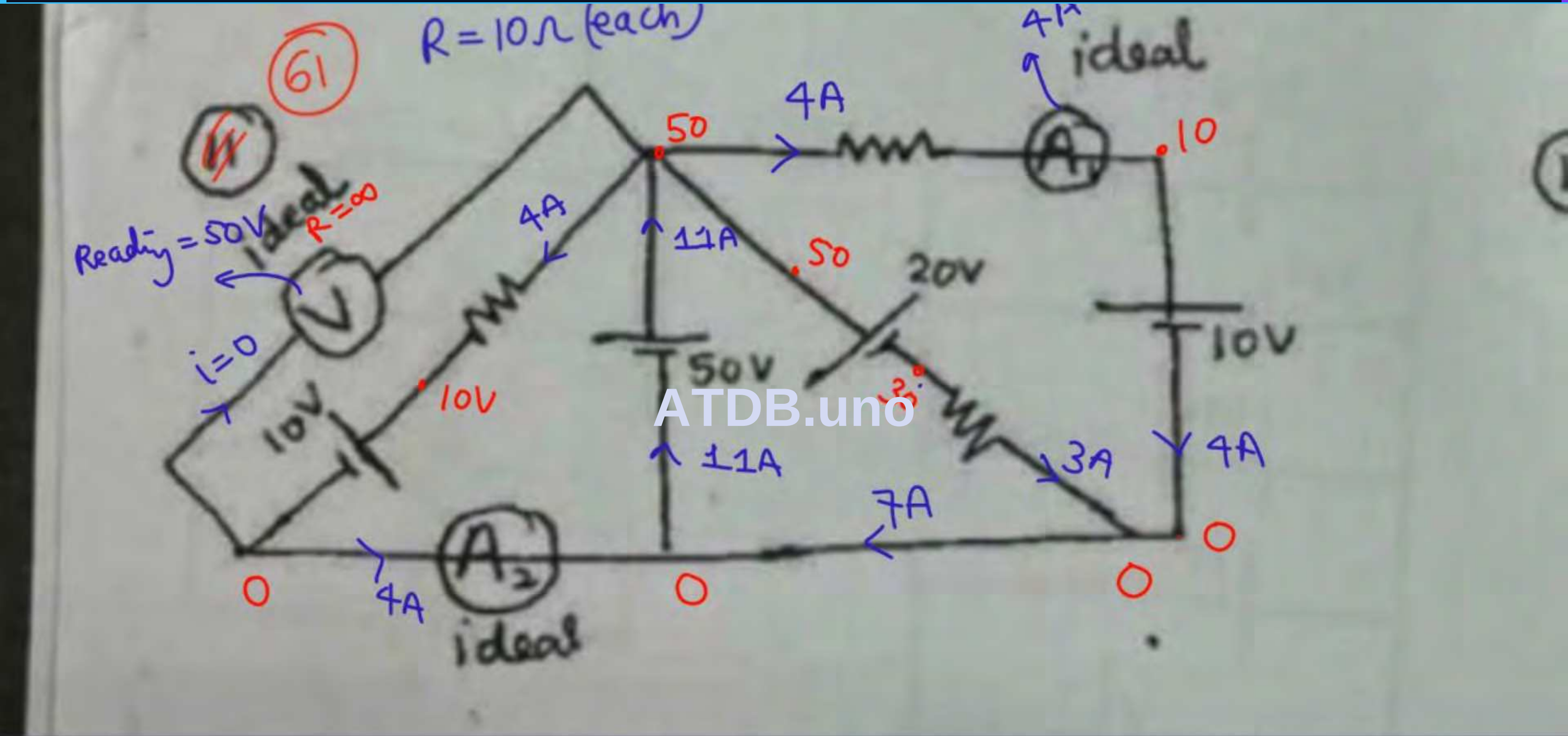


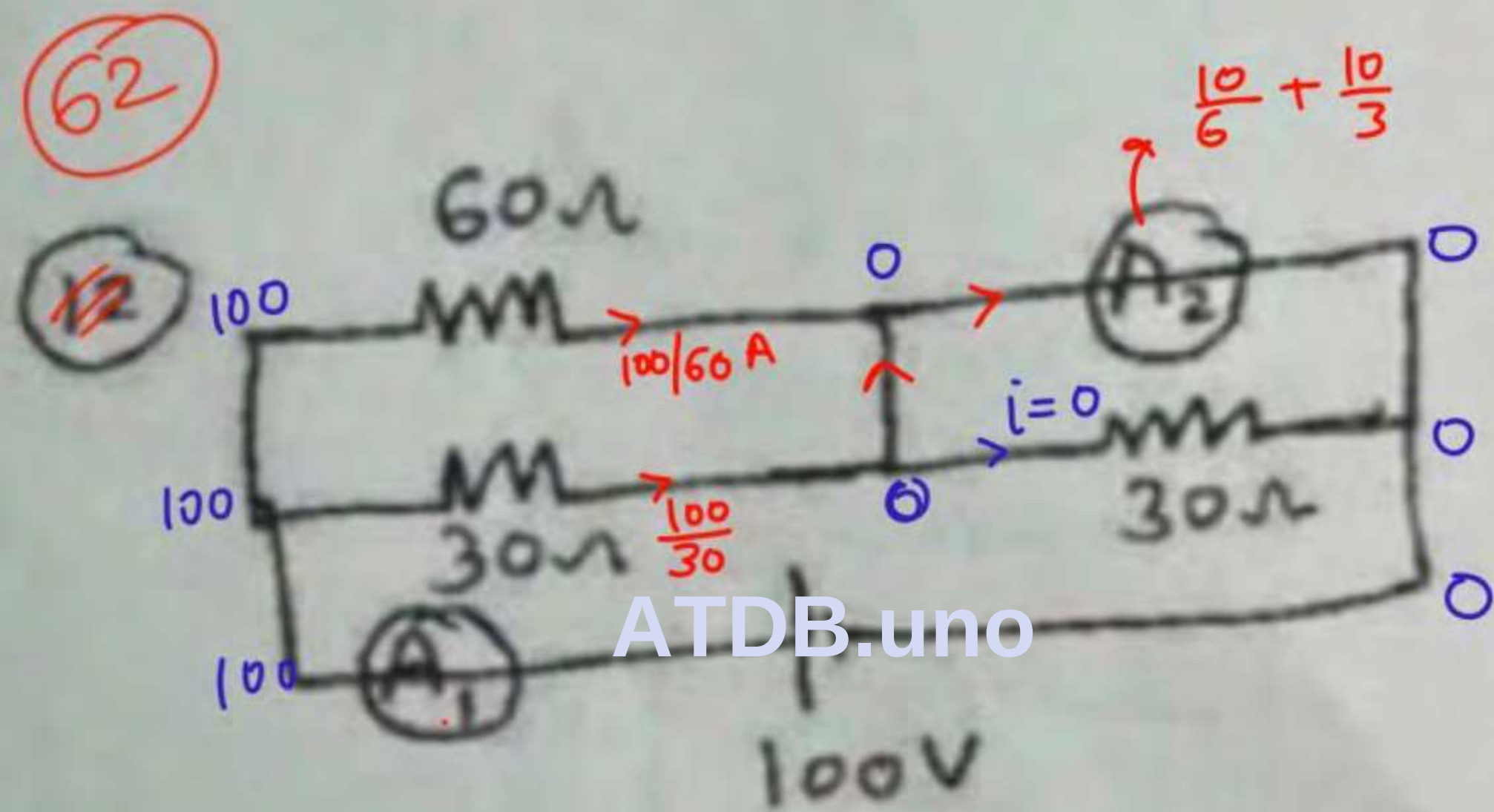
$$\frac{x-10}{10} + \frac{x-100}{10} + \frac{x+50-40}{10} + \frac{x-40}{10} = 0$$

$$4x = 140$$

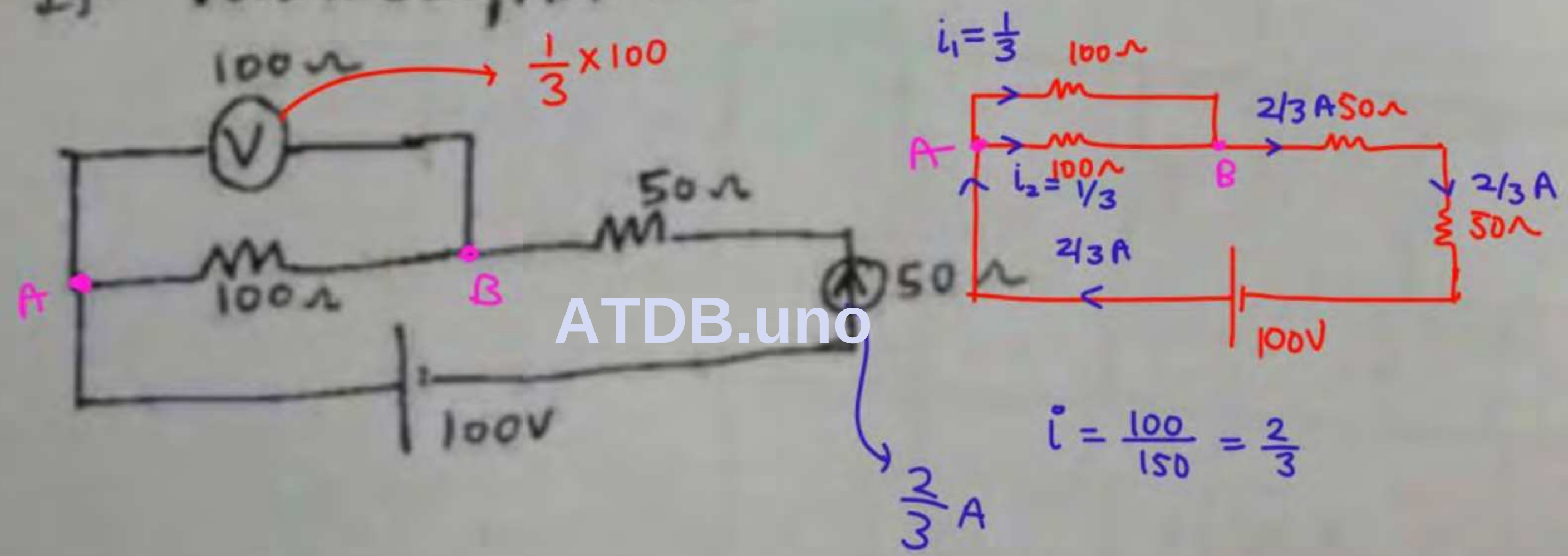
✓

(check)

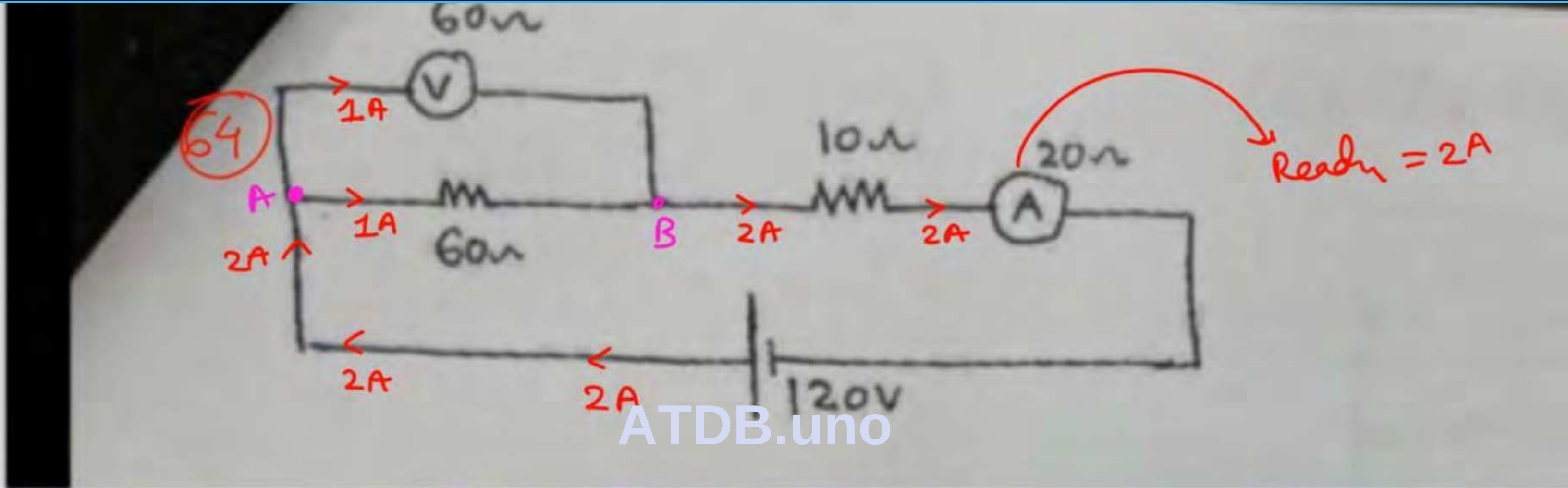




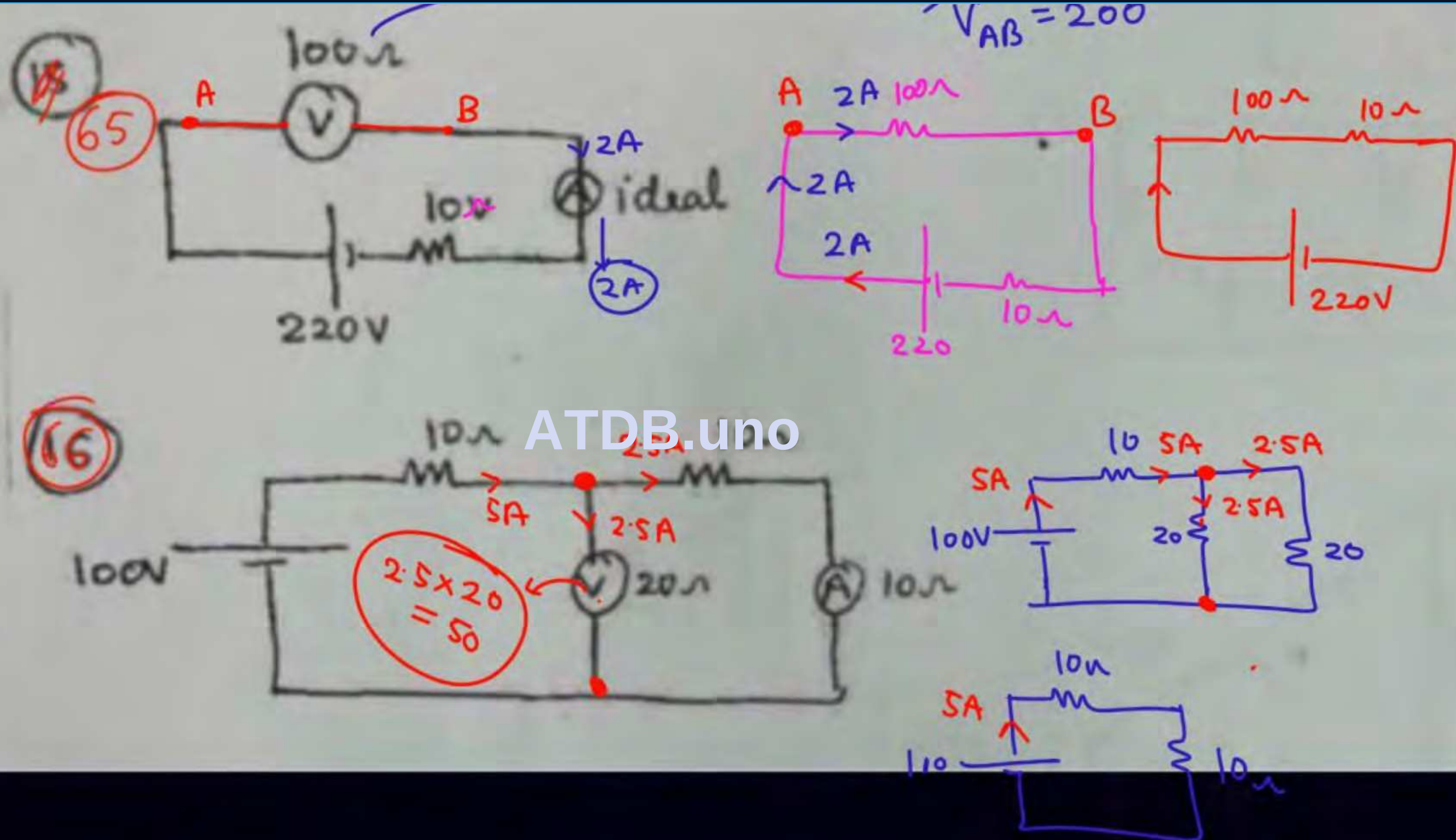
13 If volt meter/ammeter are not ideal



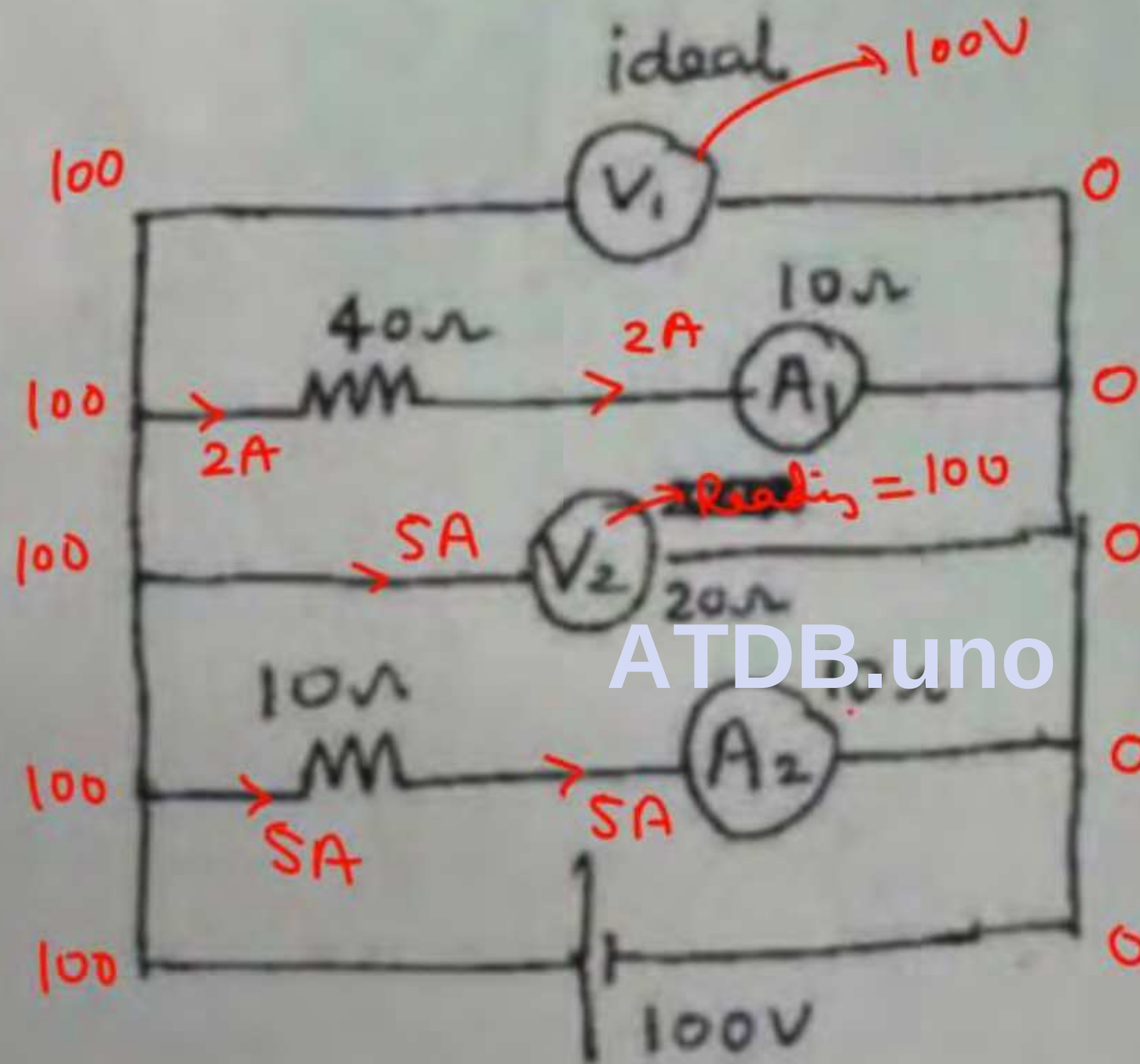
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$$V_{AB} = 1 \times 60 = 60$$

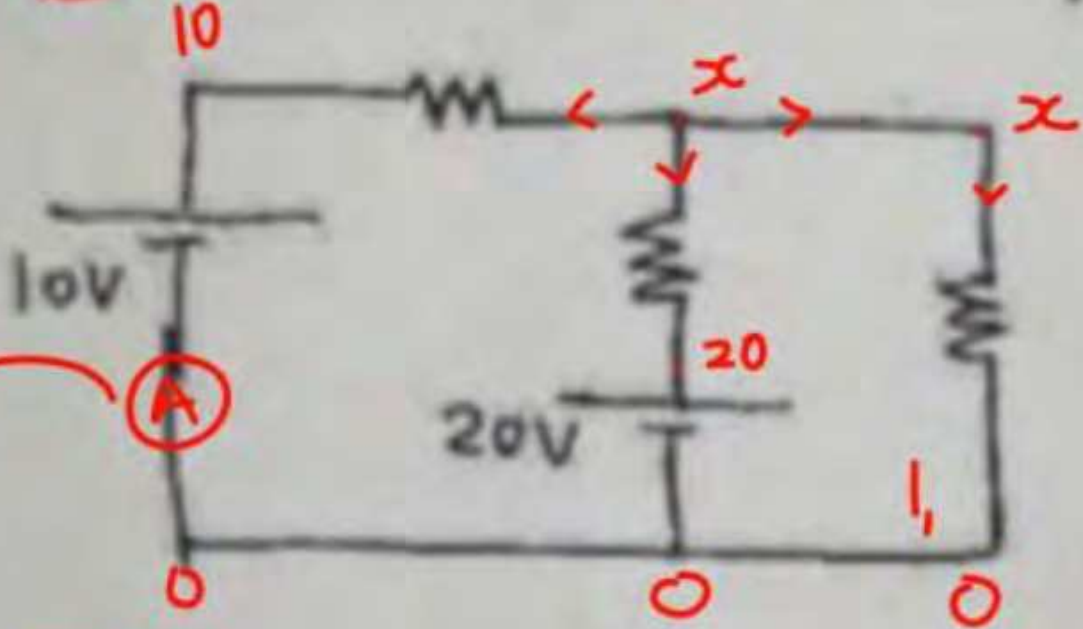


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$R = 10\Omega(\text{each})$

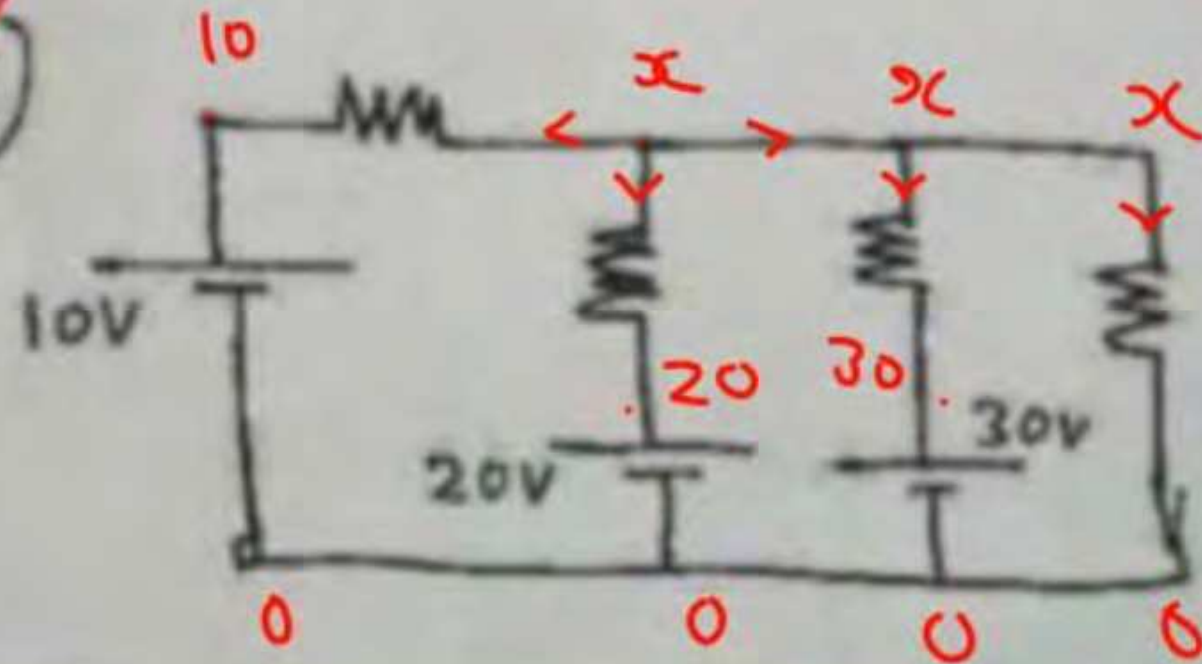
$$\frac{x-10}{10} + \frac{x-20}{10} + \frac{x-0}{10} = 0$$

$x = 10$

zero

69

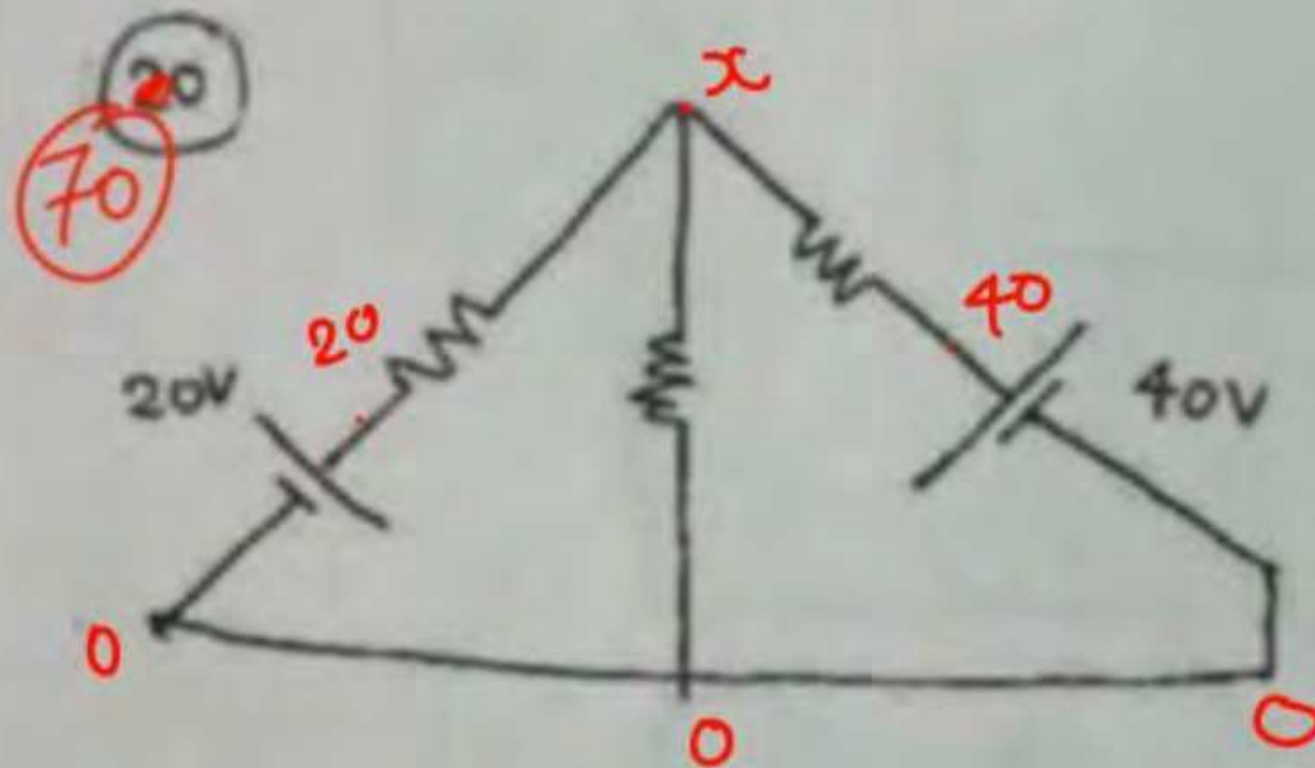
19



$$\frac{x-10}{10} + \frac{x-20}{10} + \frac{x-30}{10} + \frac{x-0}{10} = 0$$

$R = 10\Omega(\text{each})$

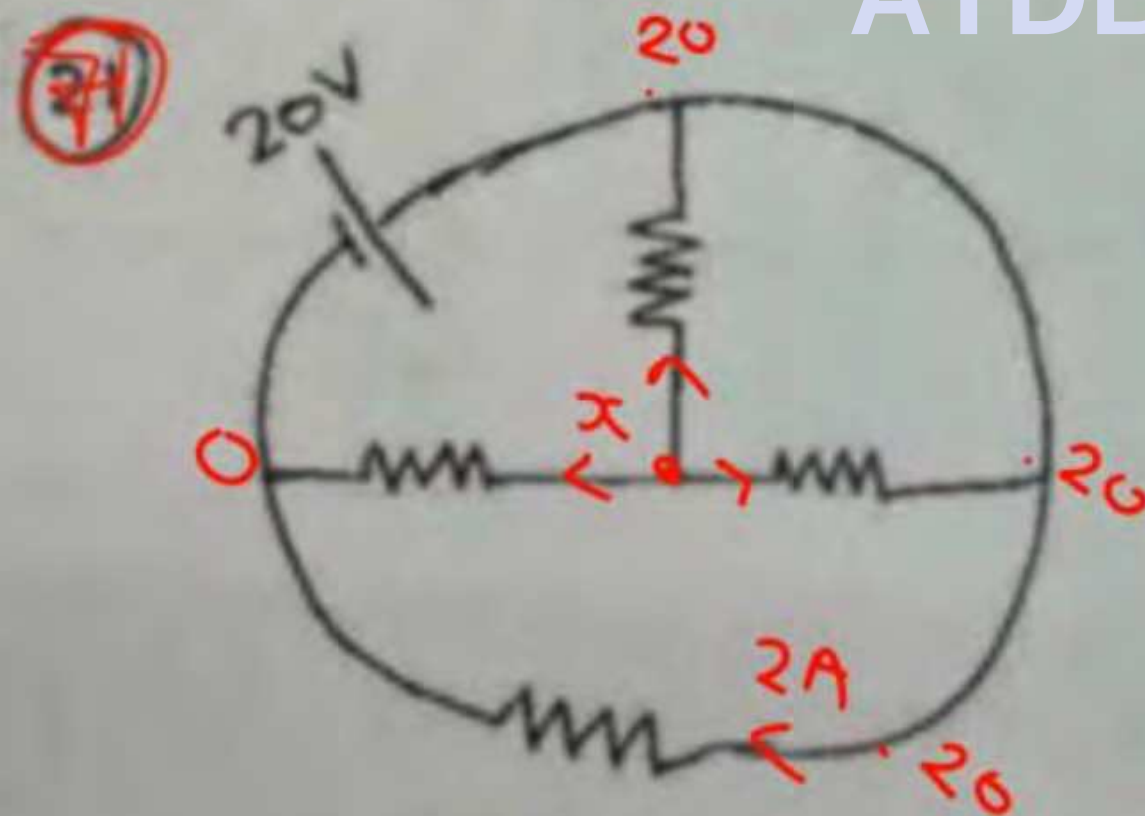
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$(R = 10\Omega \text{ each})$

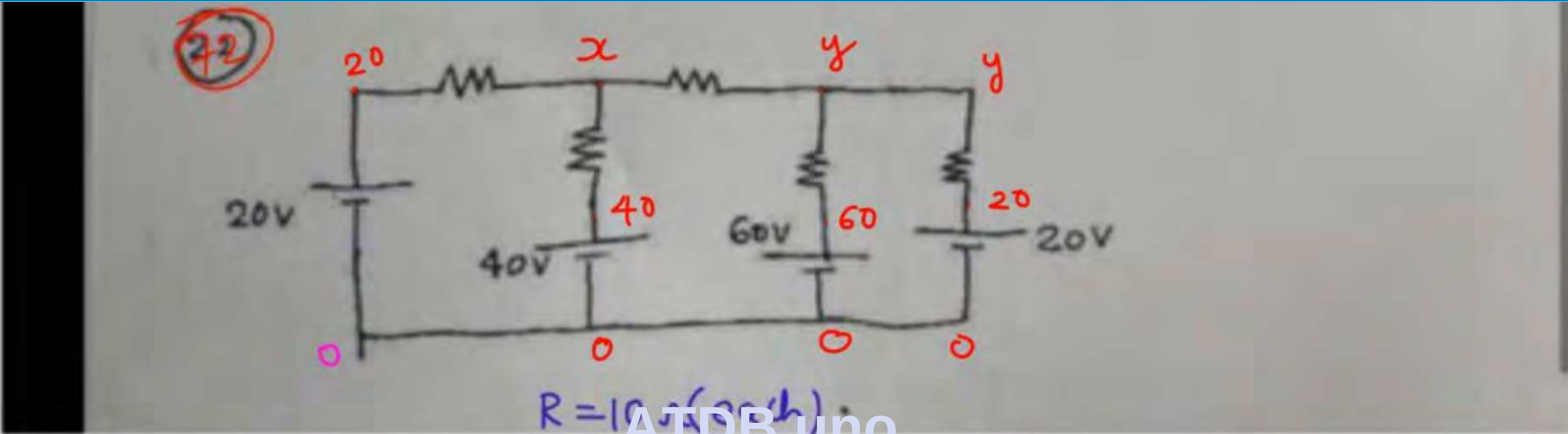
$$\frac{x-20}{10} + \frac{x-0}{10} + \frac{x-40}{10} = 0$$

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$R = 10\Omega \text{ (each)}$

$$\frac{x-20}{10} + \frac{x-0}{10} + \frac{x-20}{10} = 0$$



$$\frac{x-20}{10} + \frac{x-40}{10} + \frac{x-y}{10} = 0$$

$$\frac{y-x}{10} + \frac{y-60}{10} + \frac{y-20}{10} = 0$$



THANK YOU

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