PRAYAS

JEE 2025

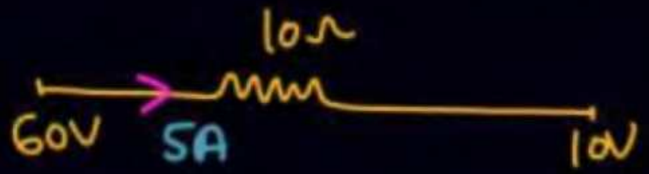
Lecture - Physics

[redacted] Current Electricity

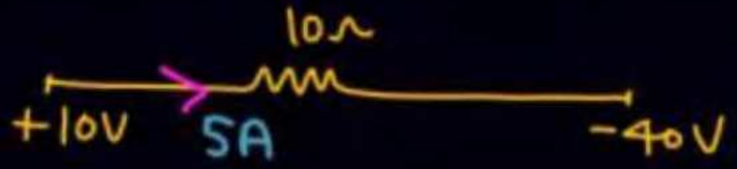
(Home Work Discussion)

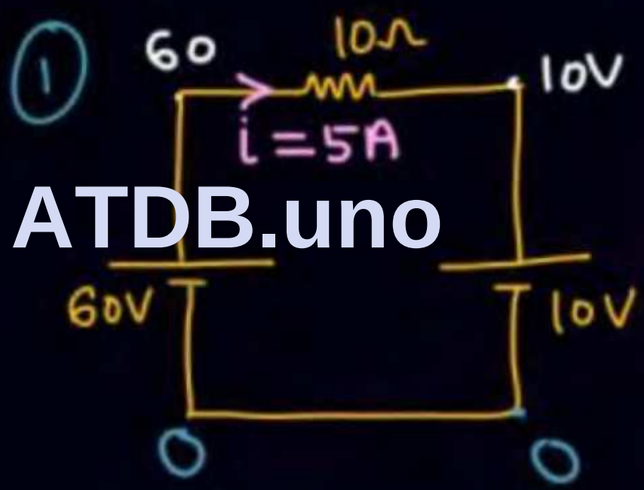
70-72 Ques.

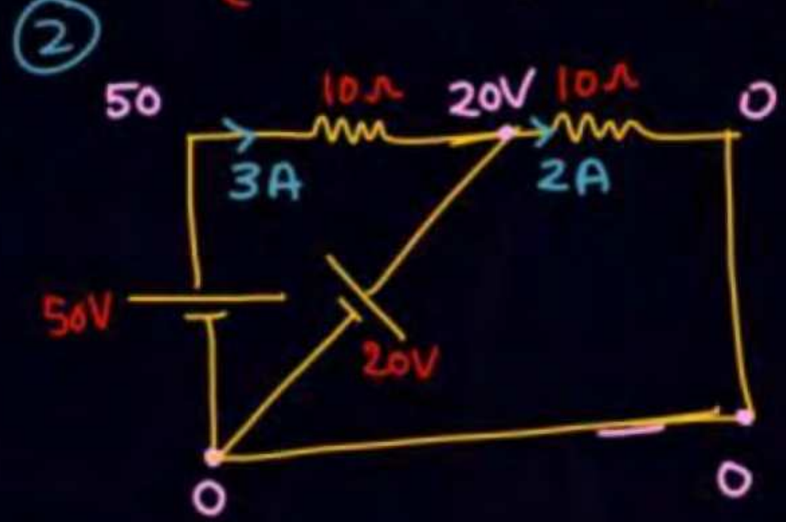
By- Saleem Ahmed Sir



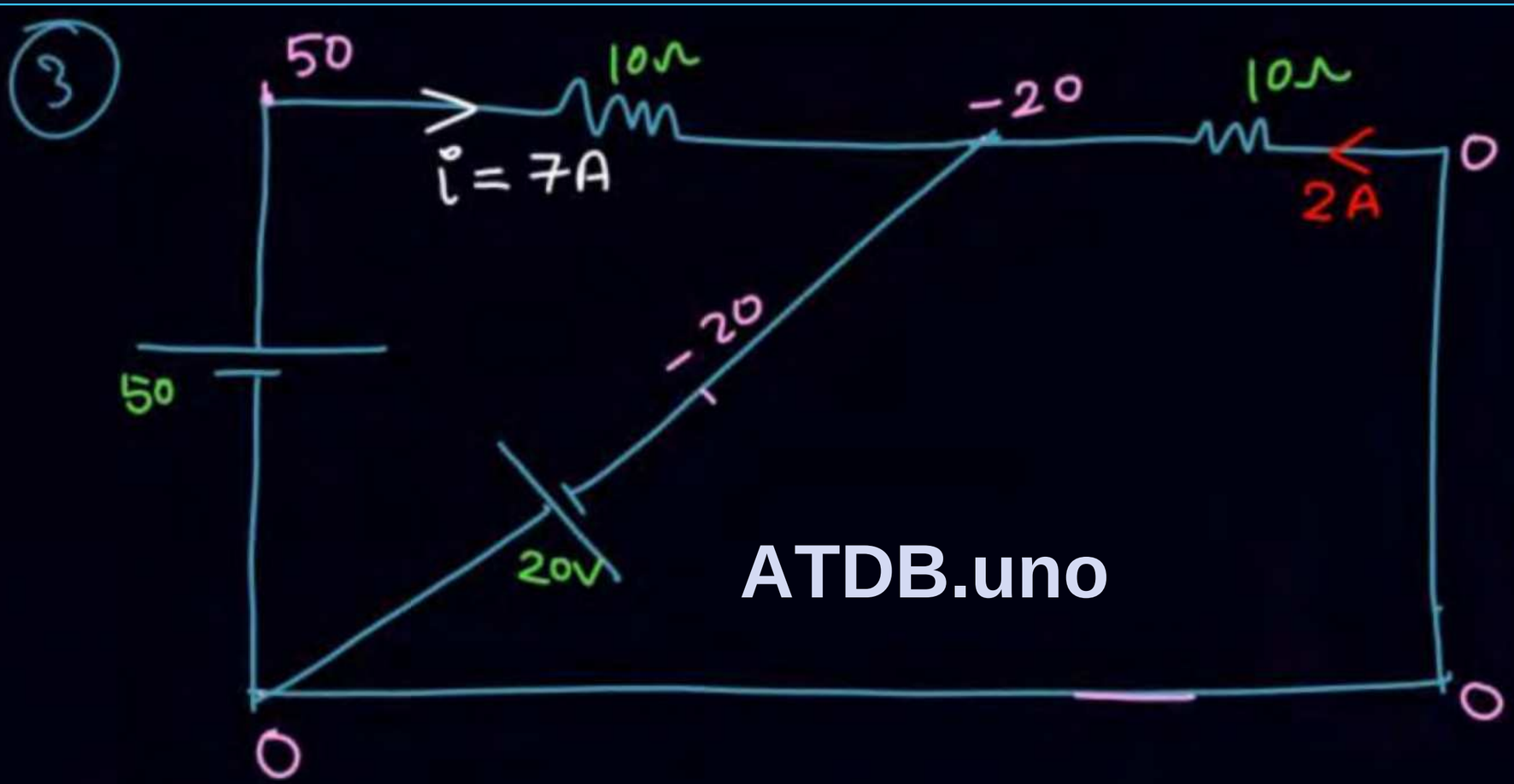
(play with circuit mario type)

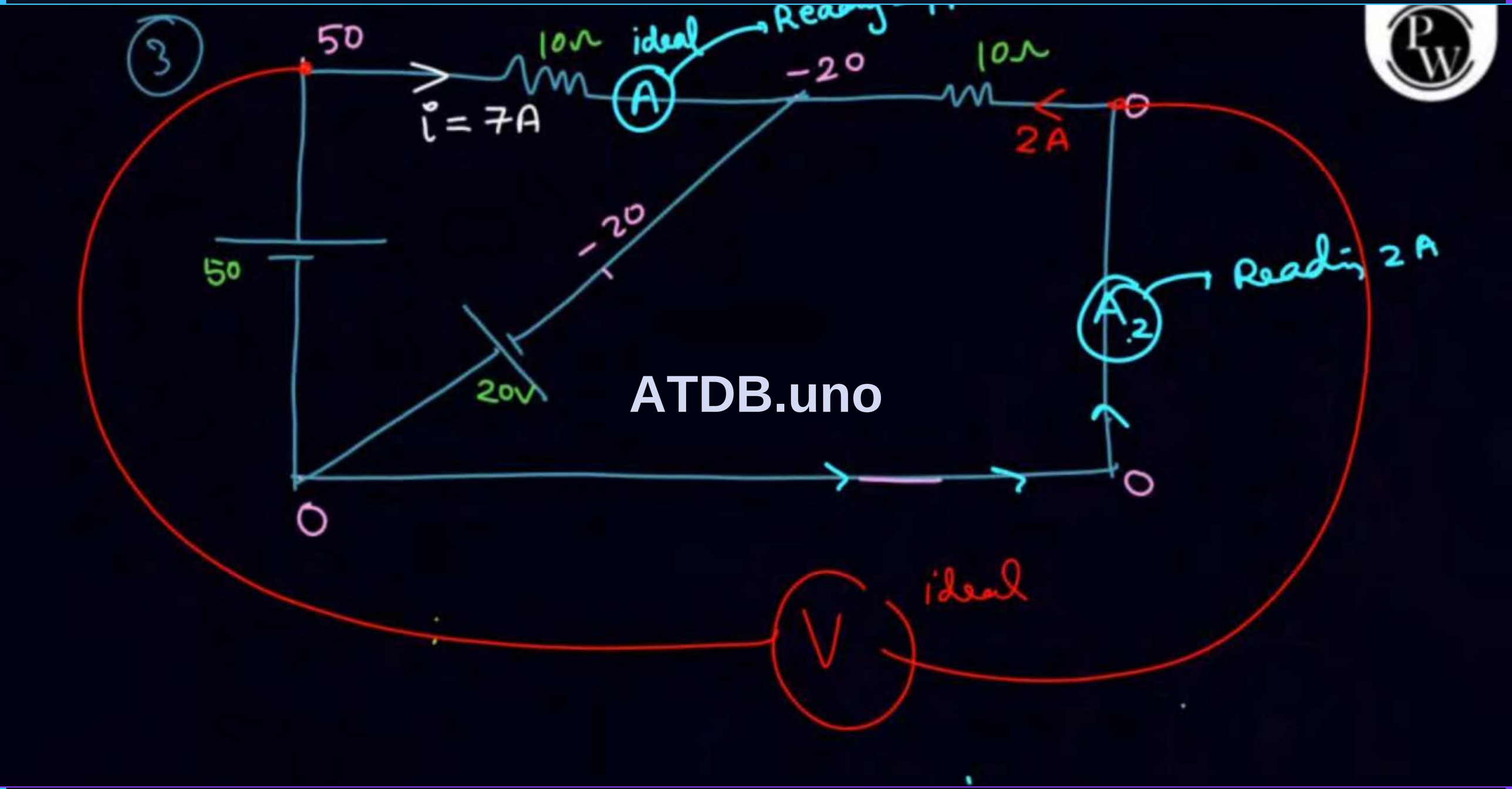






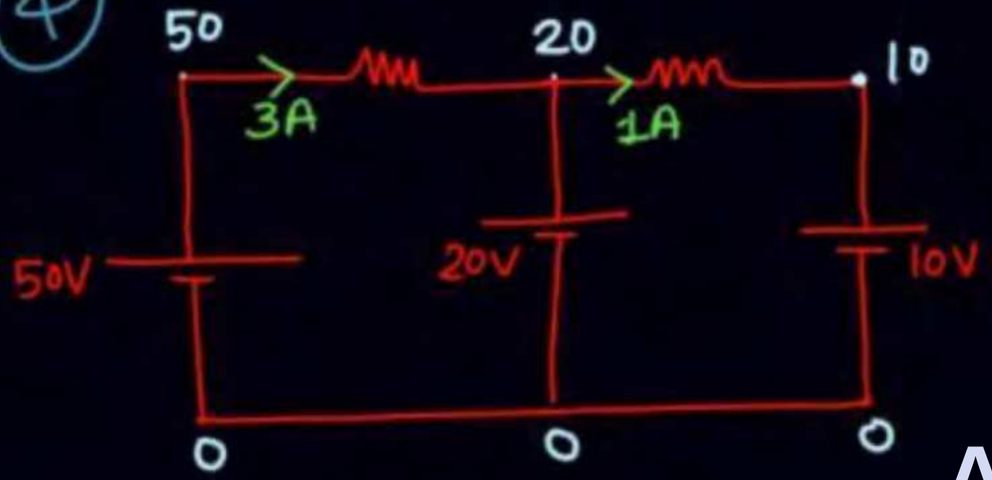
$$-30-(-50)=20$$



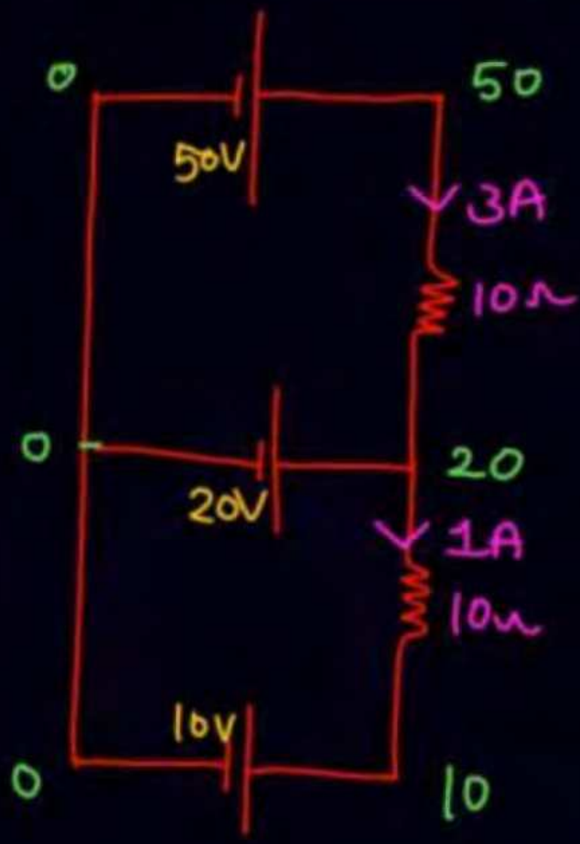


R=10Ω (equal)

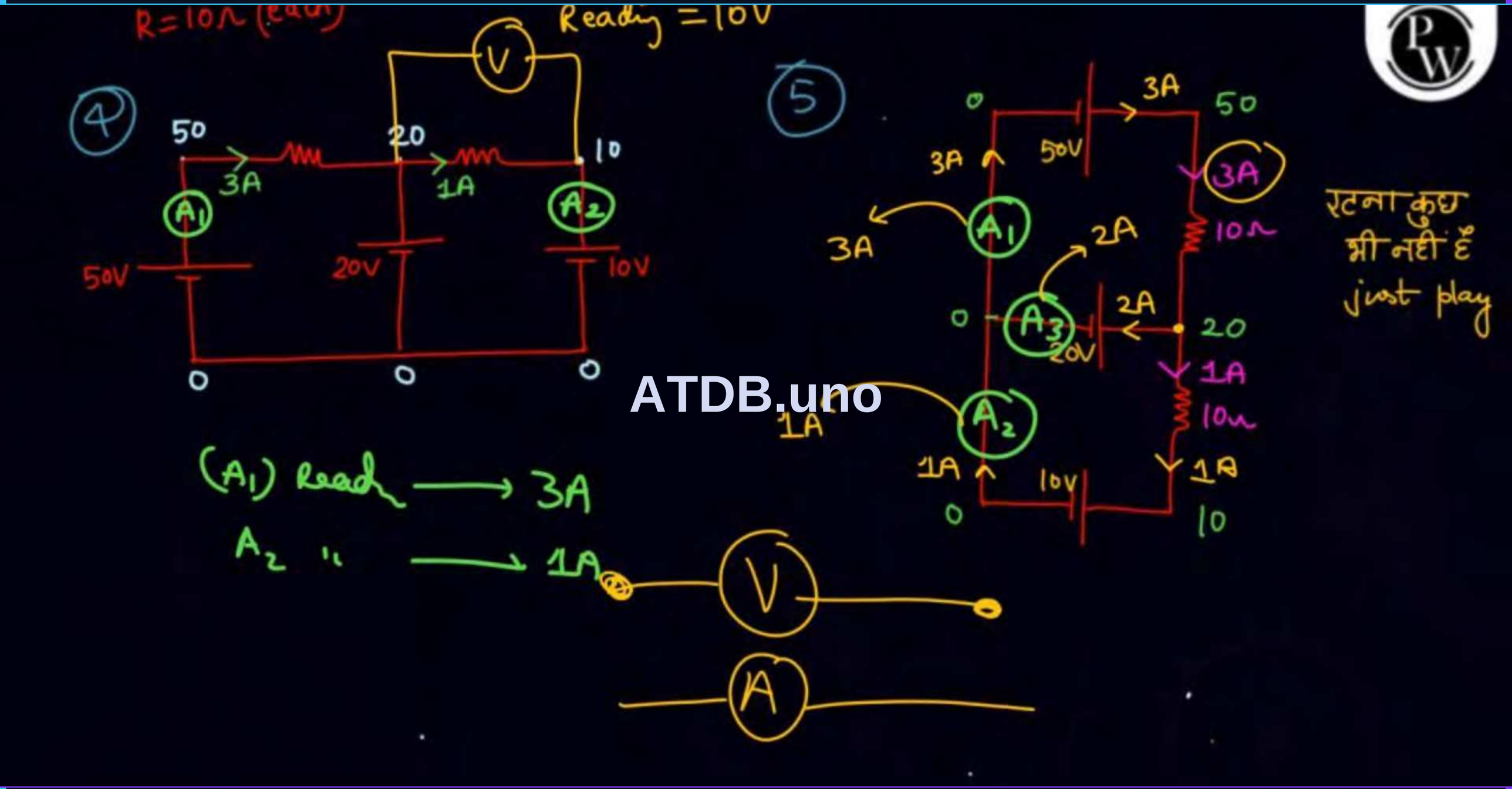
(4)



(5)

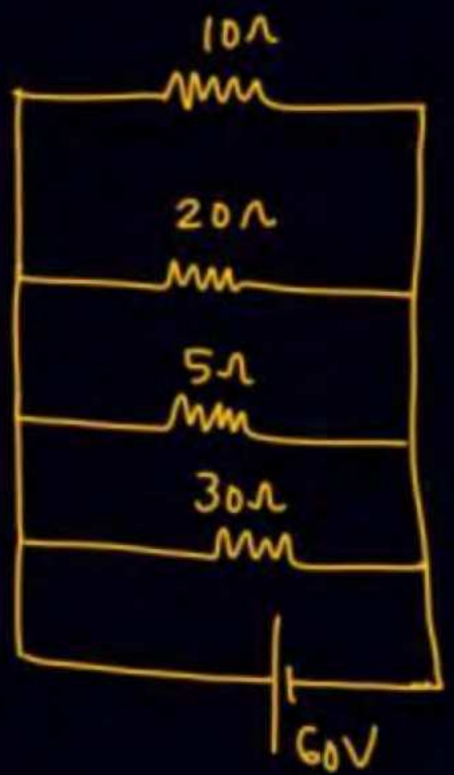


रटना कुछ भी नहीं है just play



Q

Q 6



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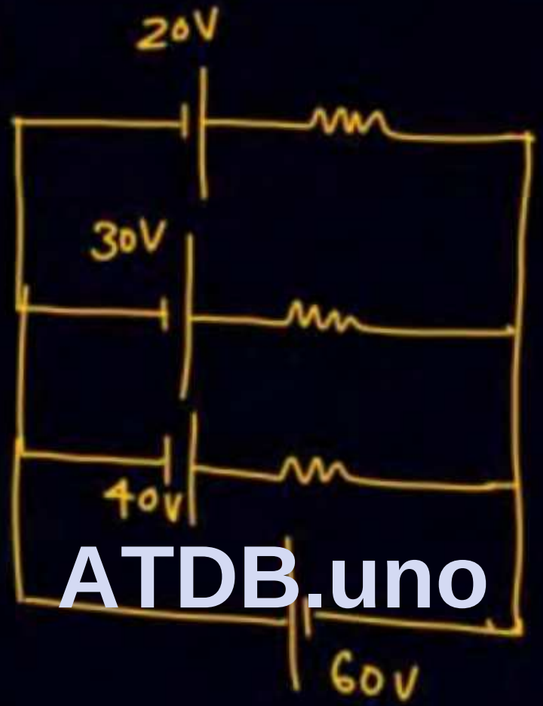
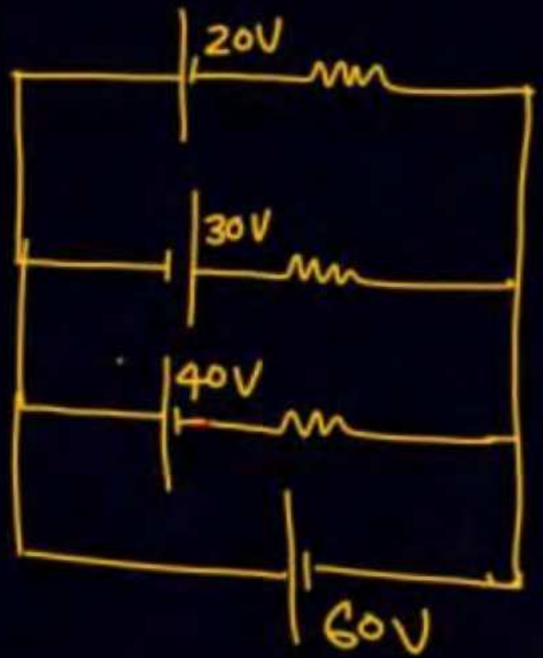


R = 10Ω (each)

(Battery को SS [illegible] से देखिये)

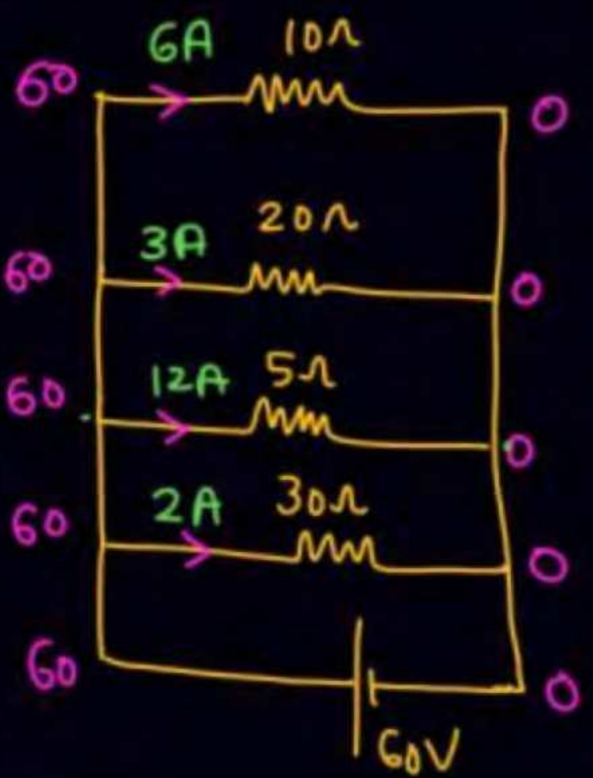
8



R = 10Ω (each)

Sol

6



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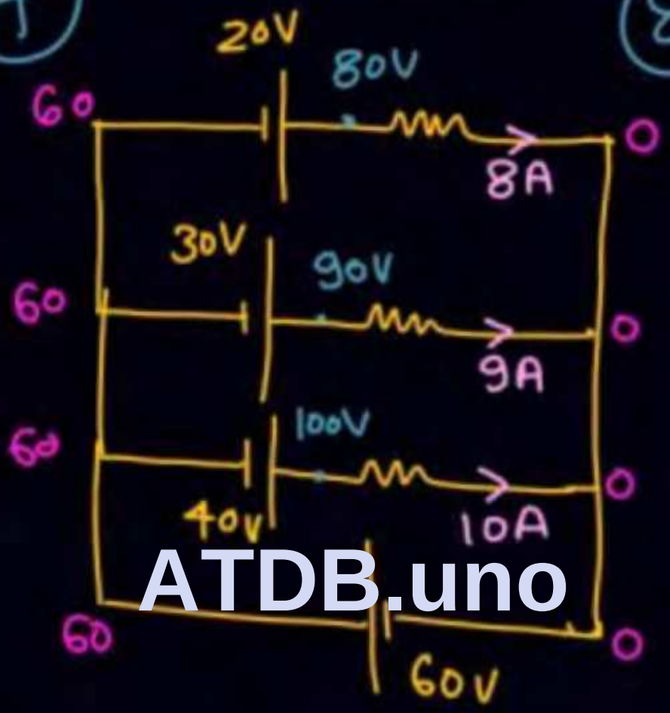
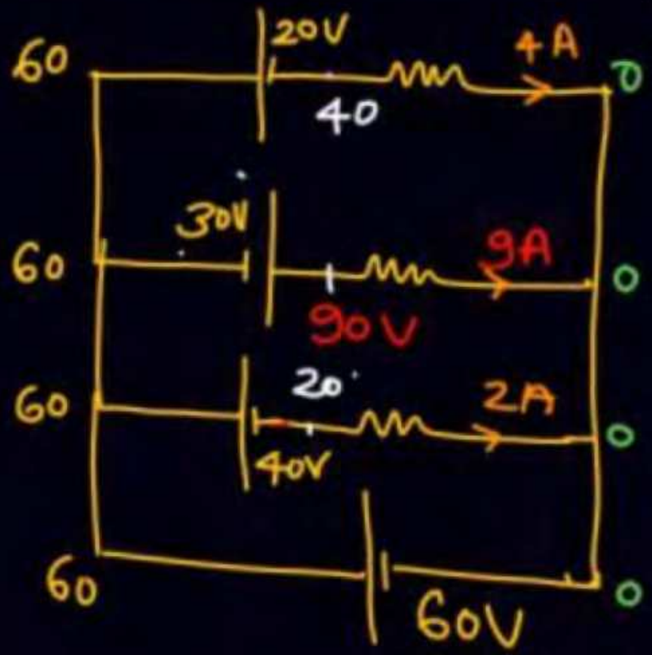
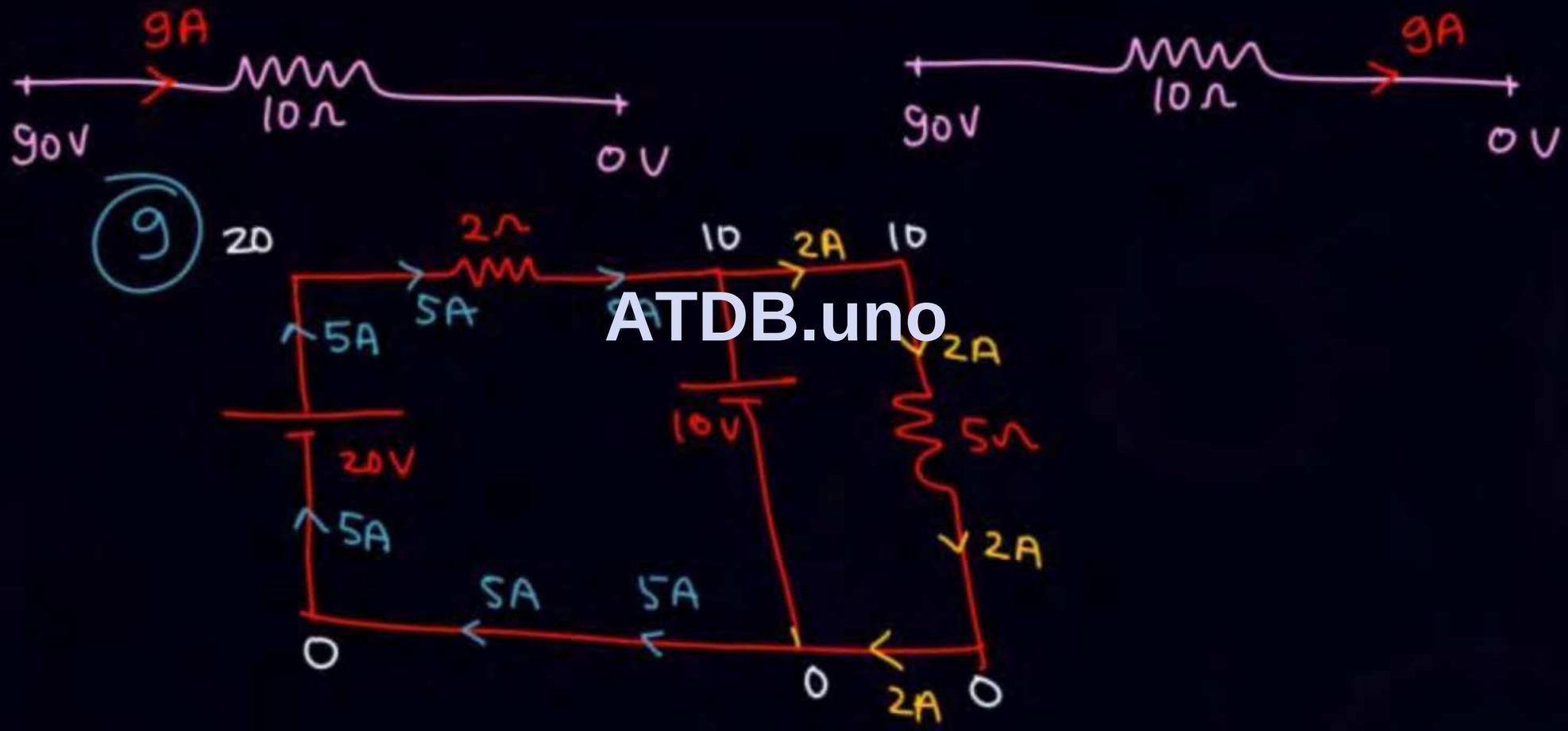


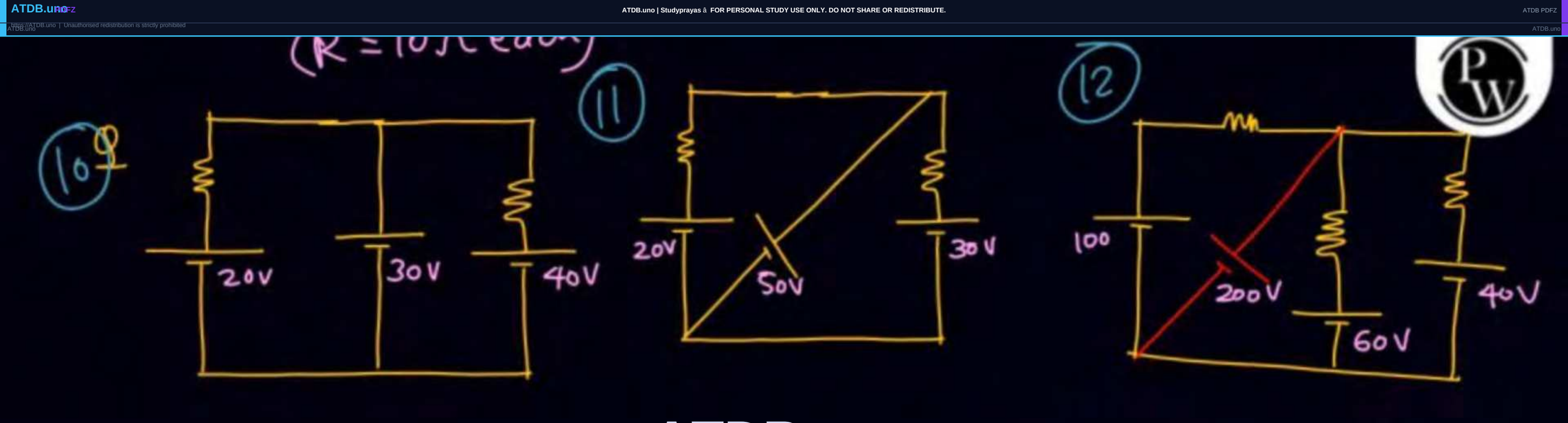
R = 10Ω (each)

8 (Battery को SS [illegible] से देखते हैं)

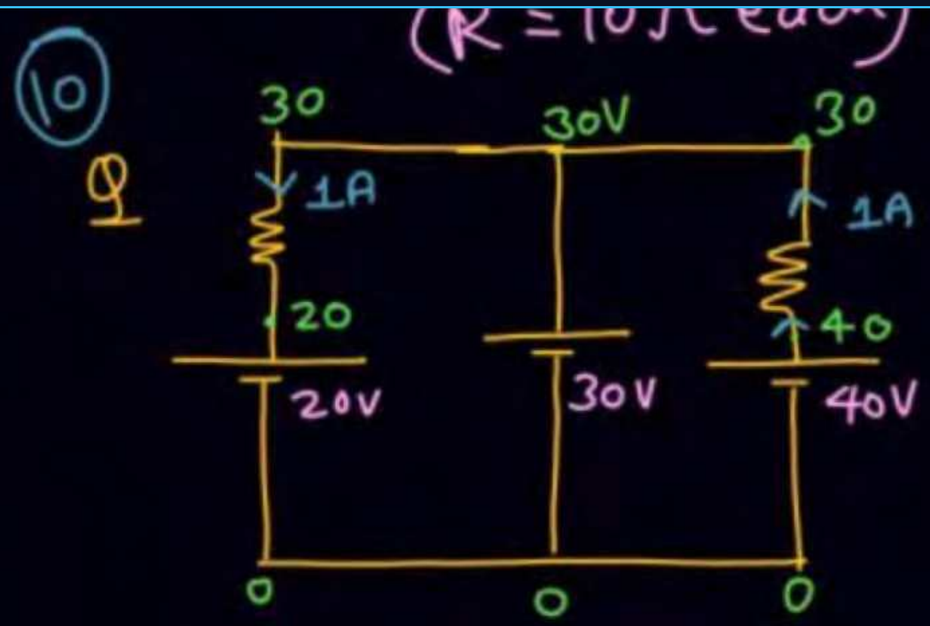


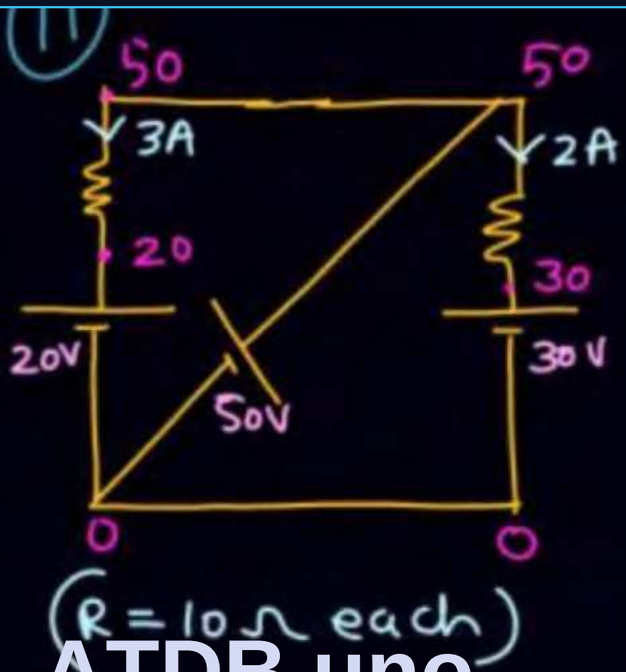
R = 10Ω (each)

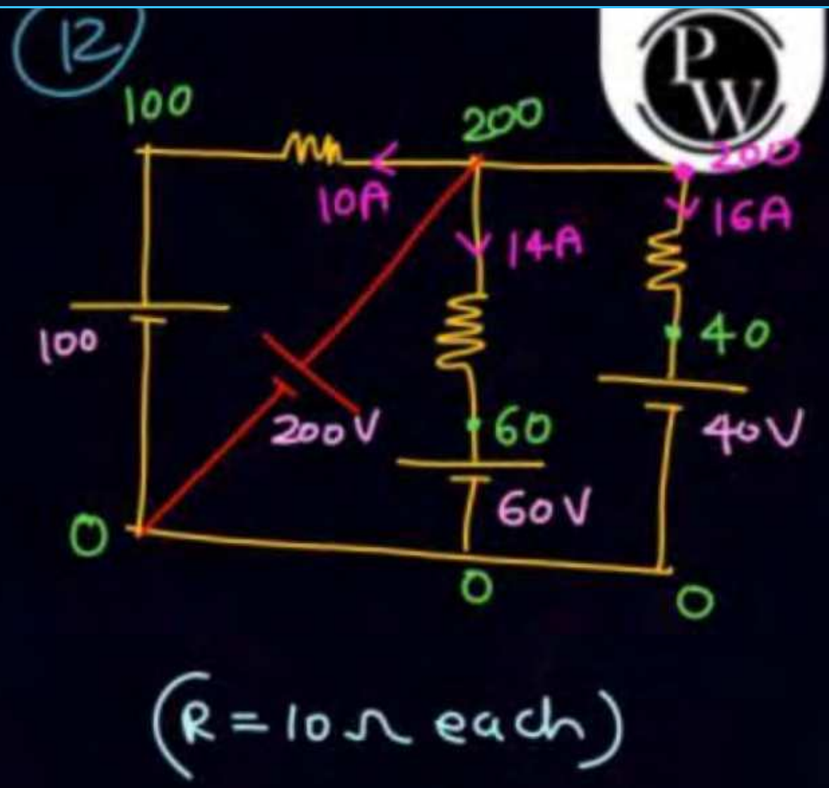




ATDB.uno

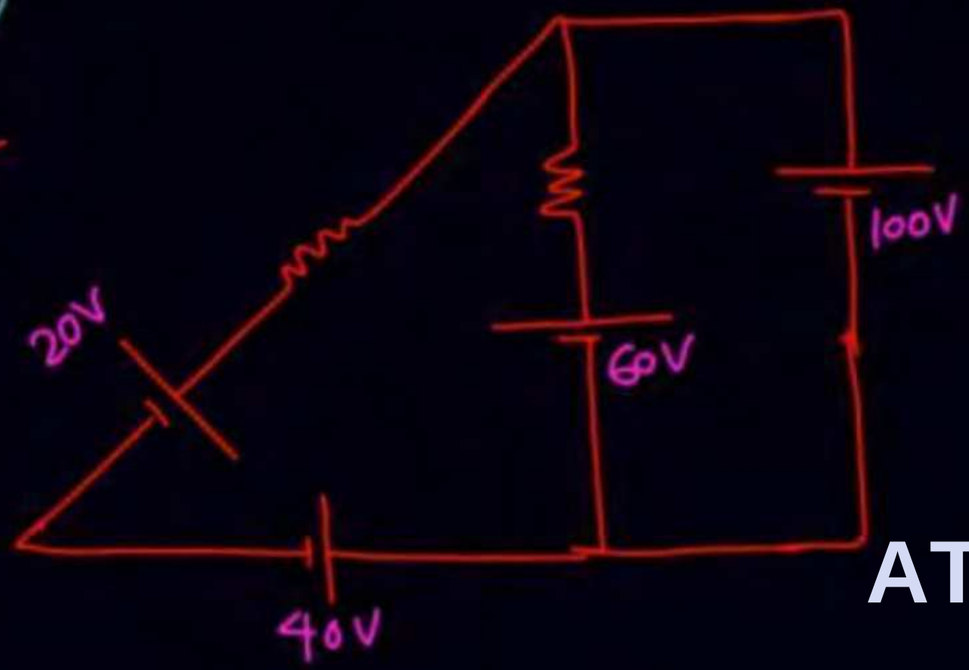






13

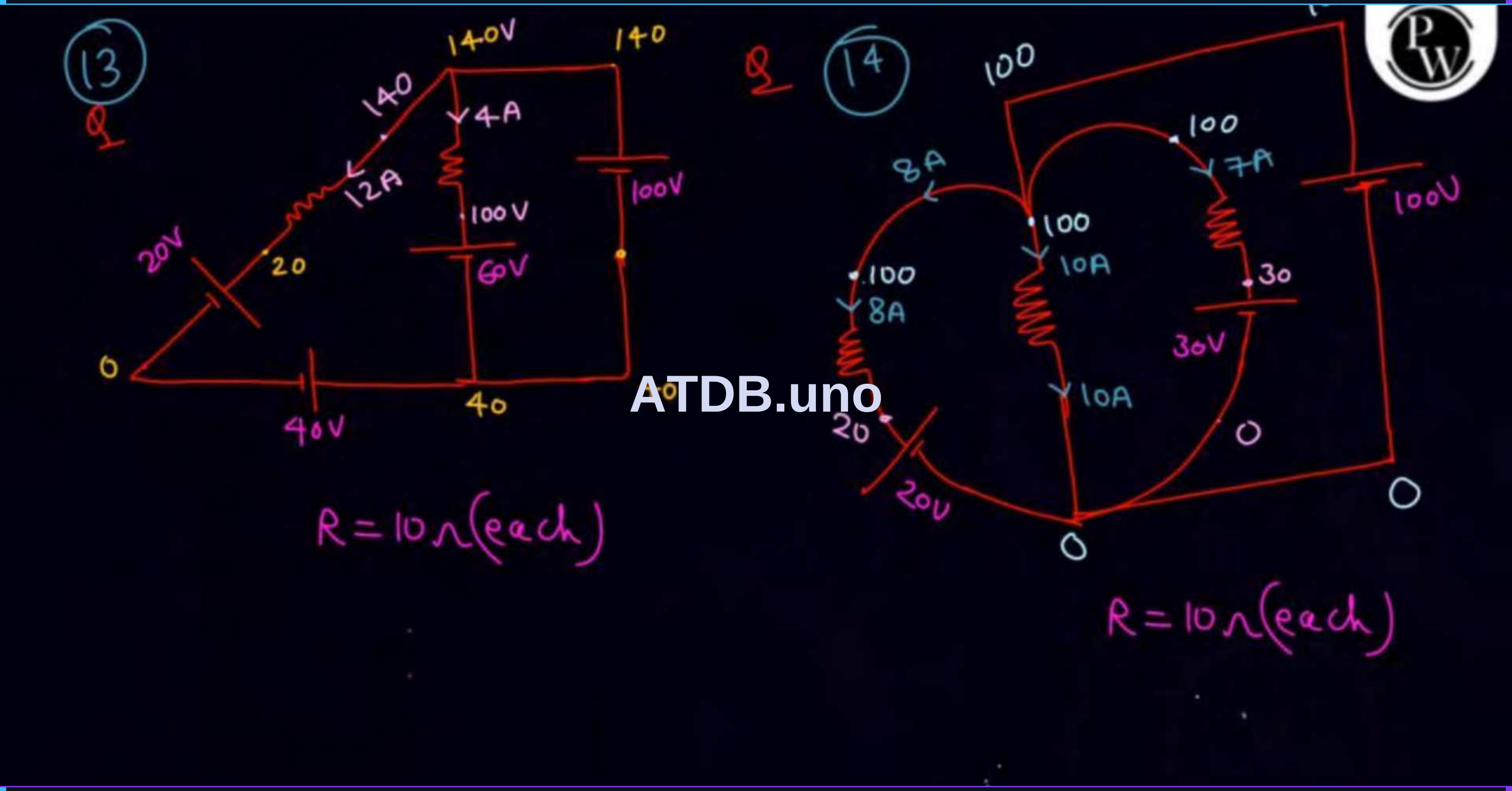
Q



$R = 10\,\Omega$ (each)

Q 14

$R = 10\,\Omega$ (each)



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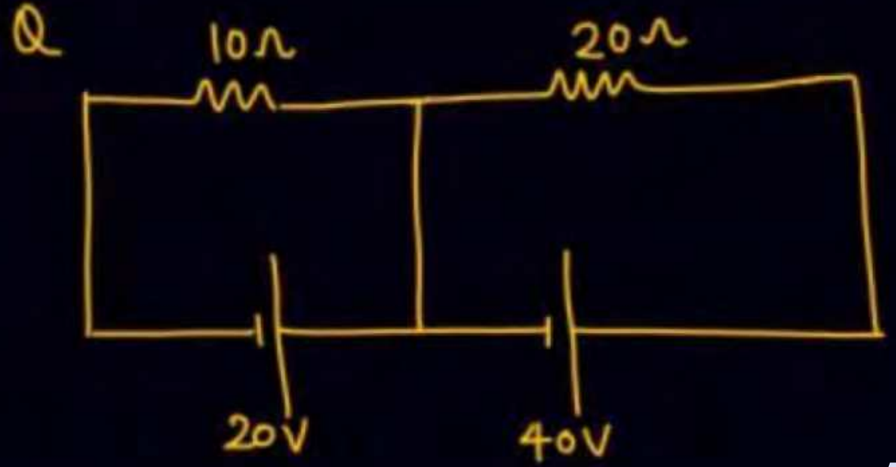

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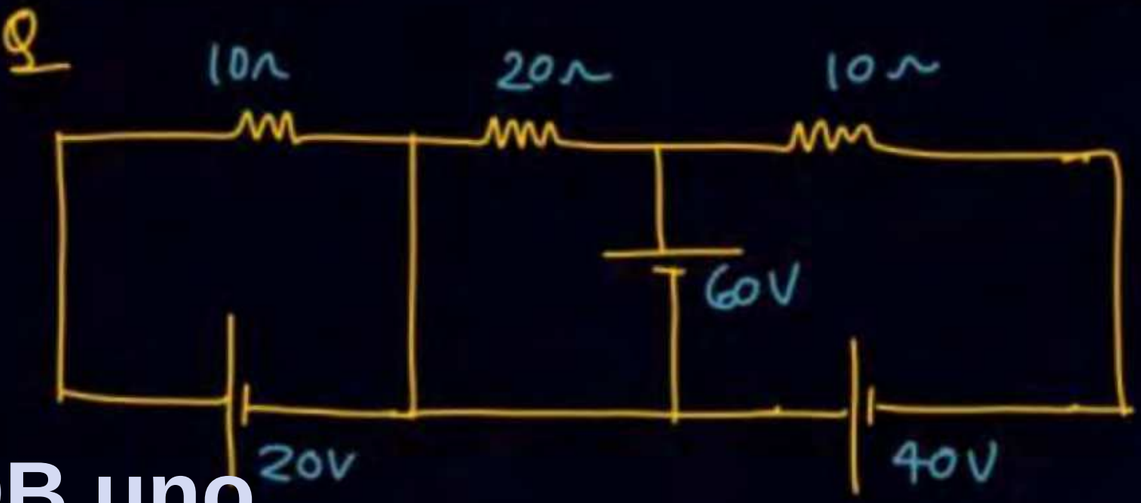

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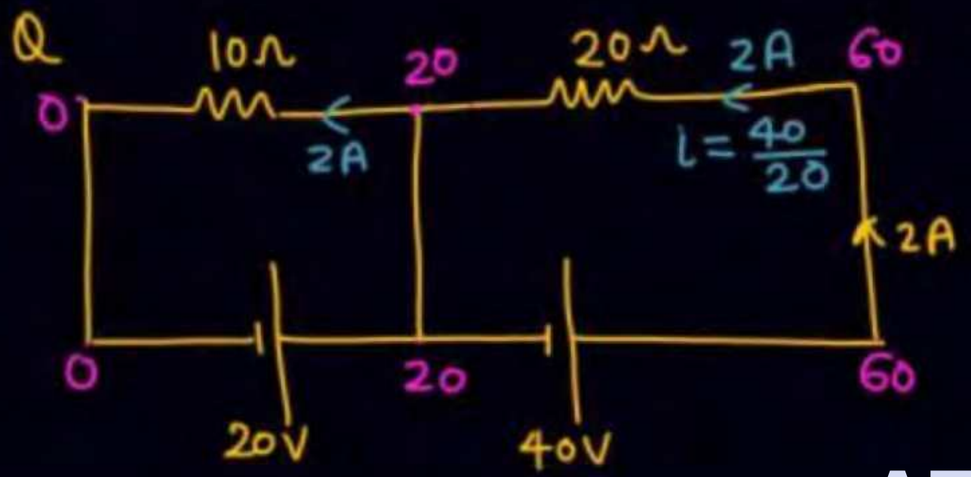

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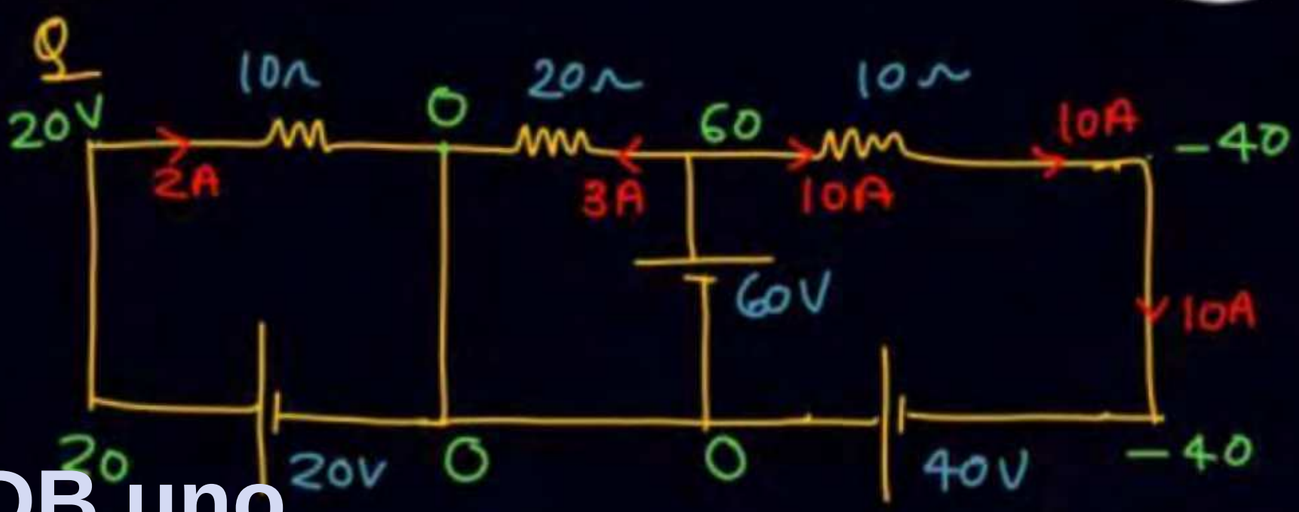

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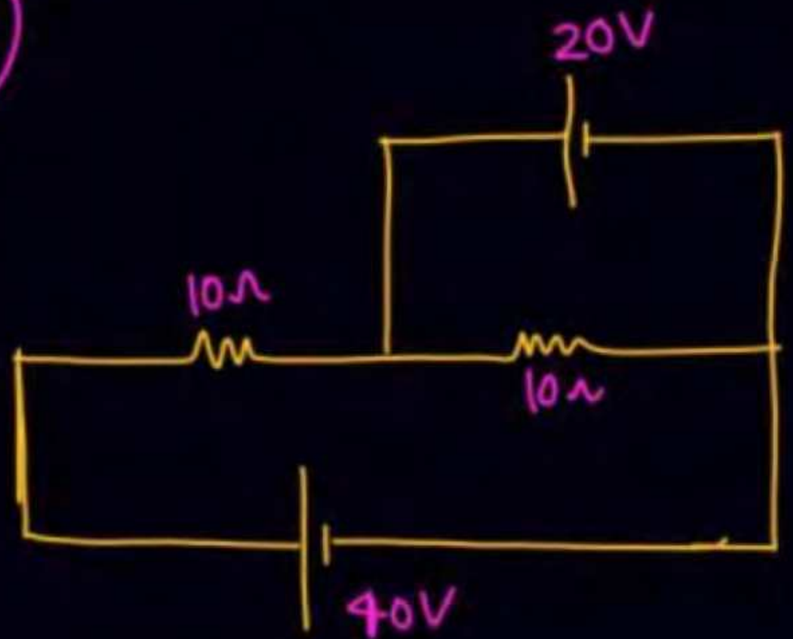
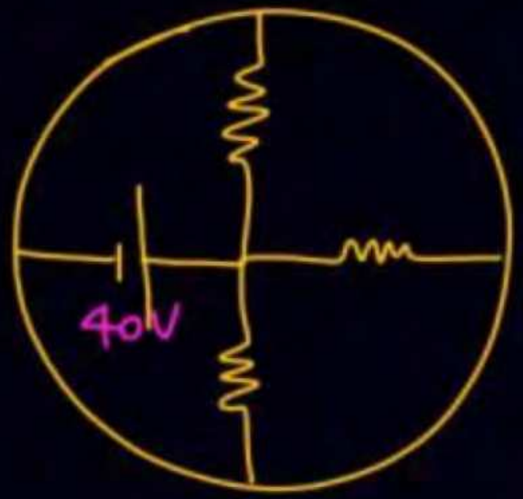
Q



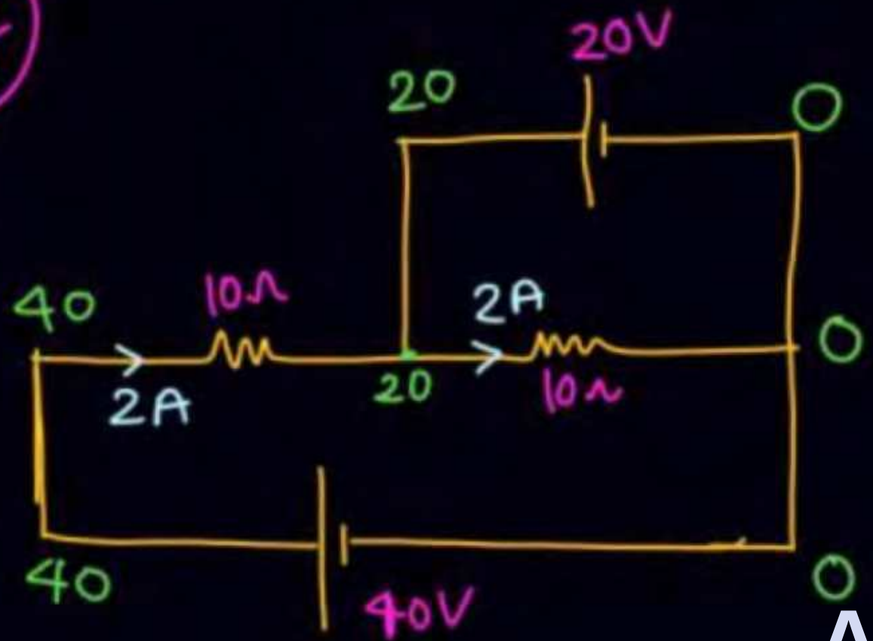
18

Q



(R = 10Ω each)

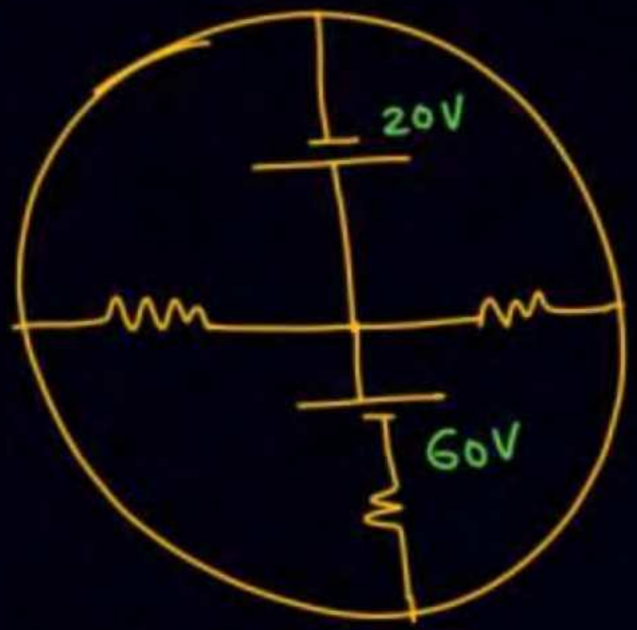
17



18

(R = 10Ω each)

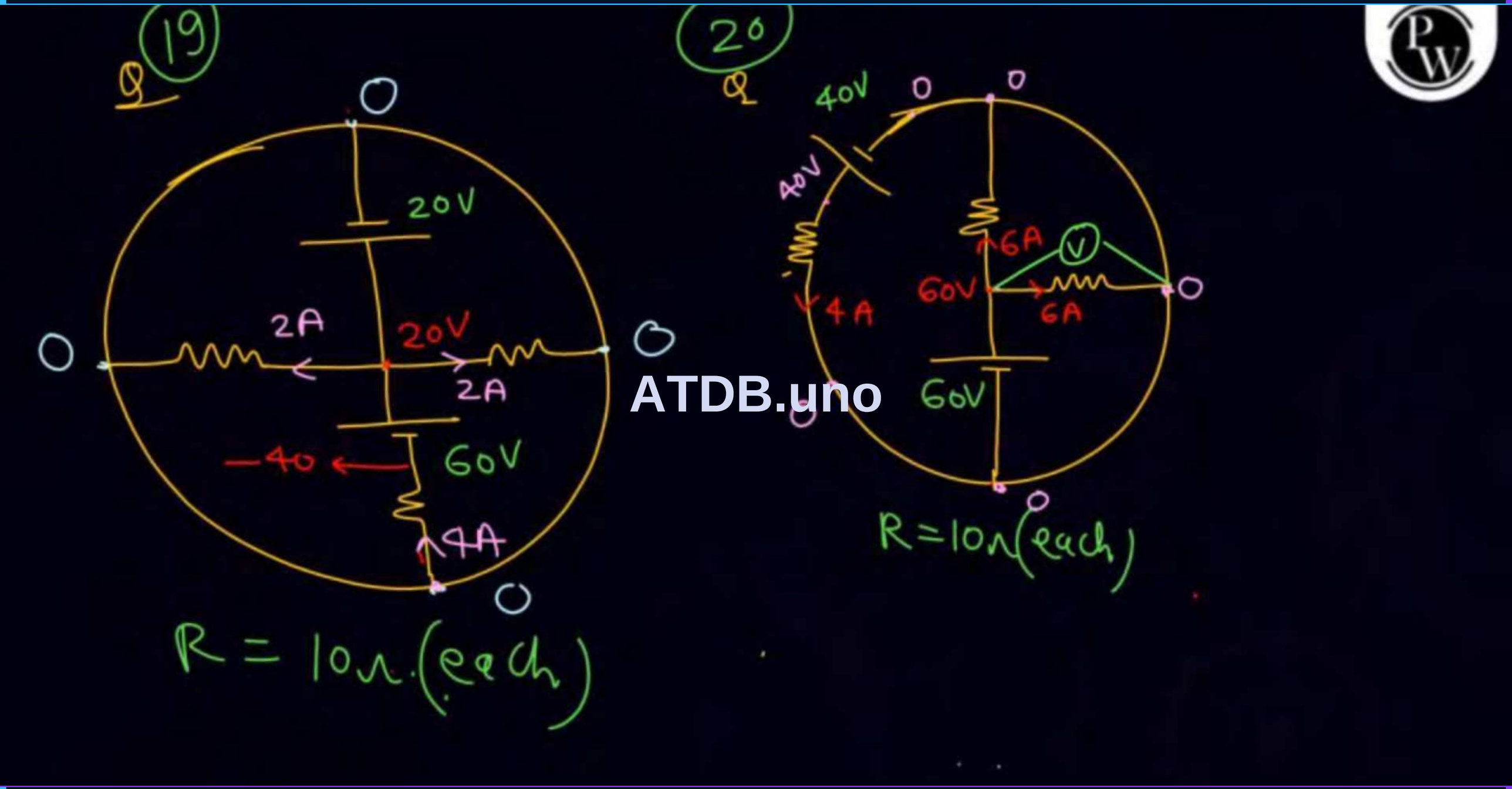
Q 19

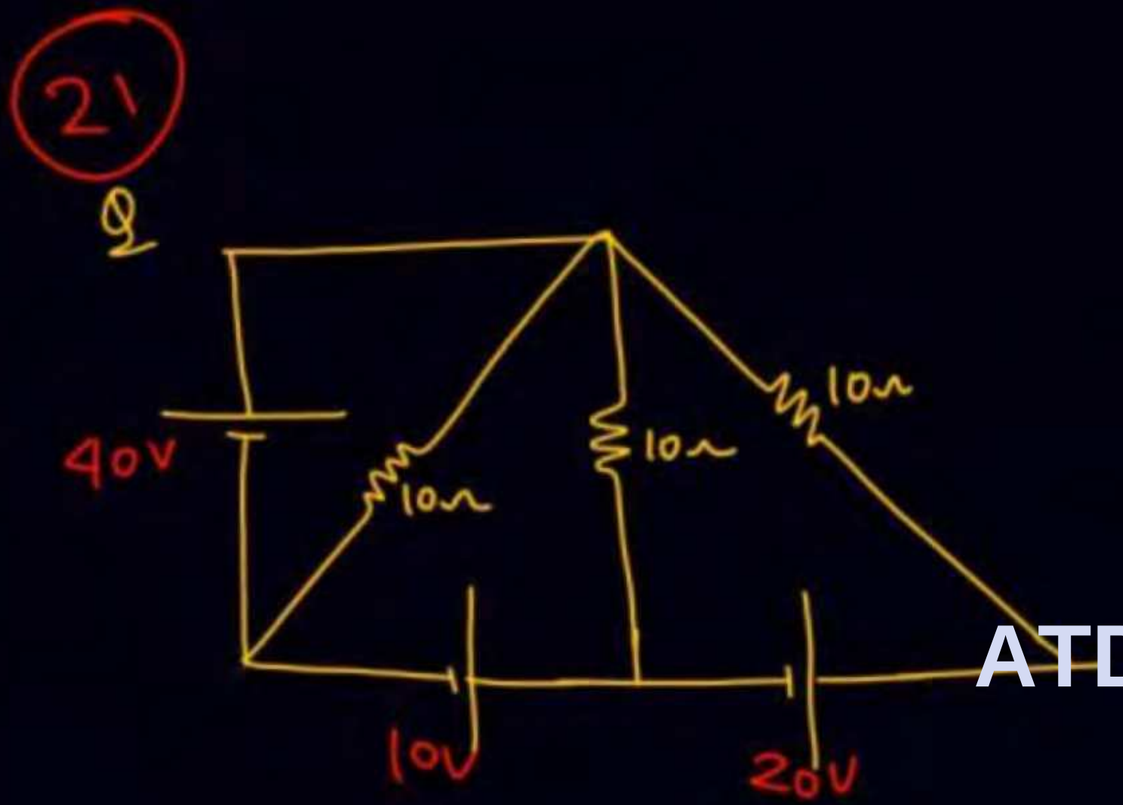


R = 10Ω (each)

Q 20

R = 10Ω (each)





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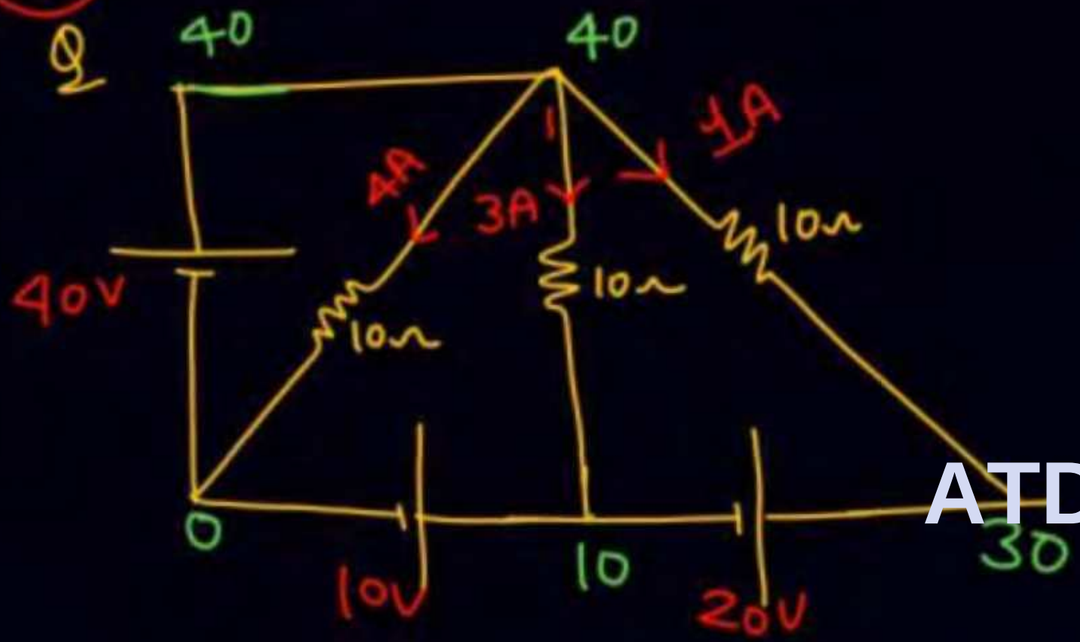
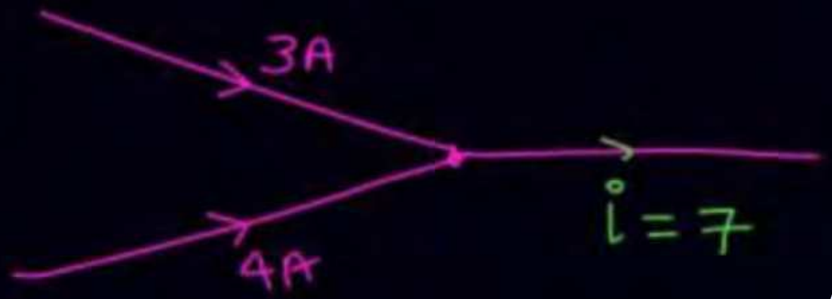
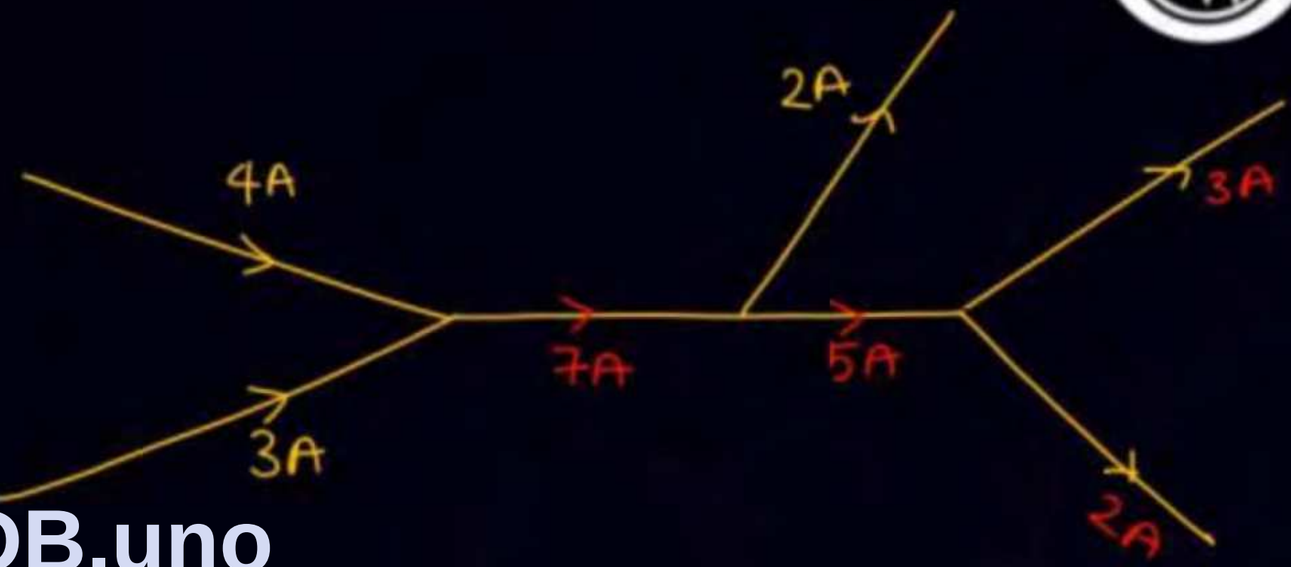
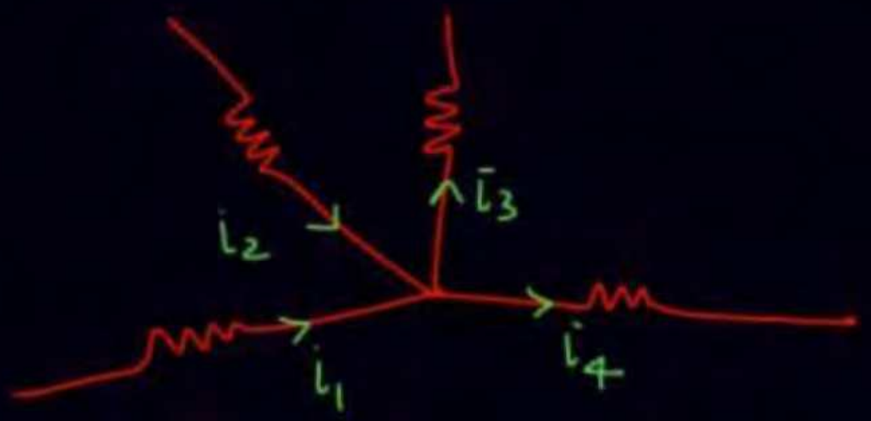


junction Law





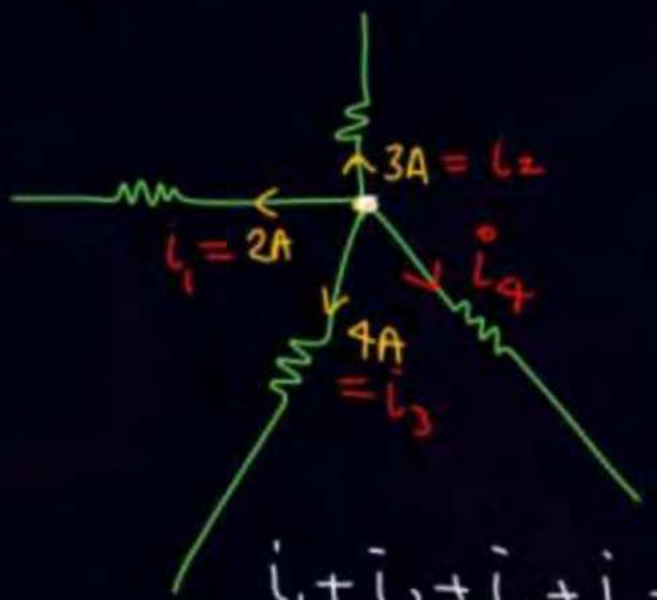
Junction Law



$$i_1 + i_2 = i_3 + i_4$$

इसका सा modification

जाने वाली सारी Current का sum = 0

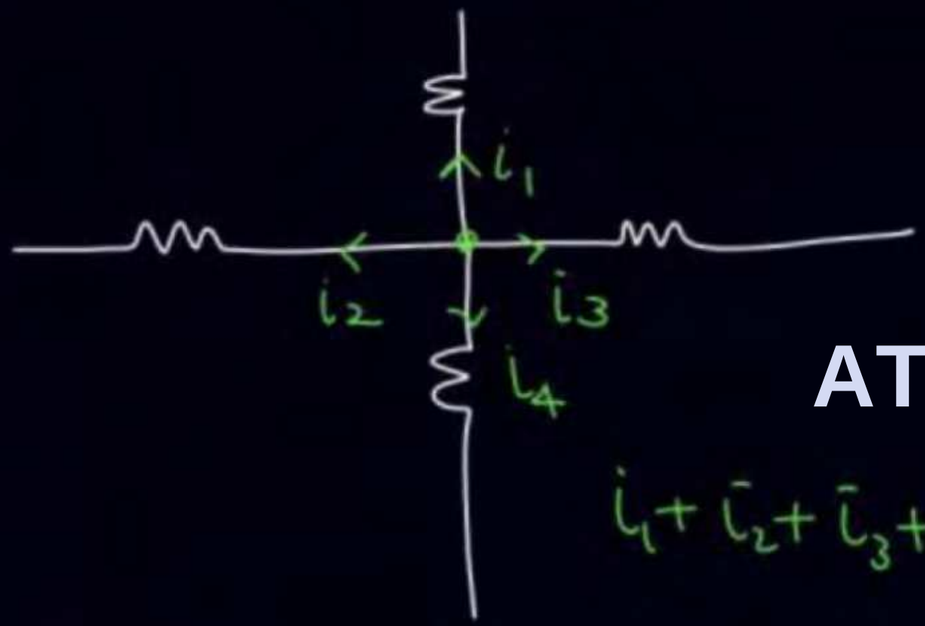


$$i_1 + i_2 + i_3 + i_4 = 0$$

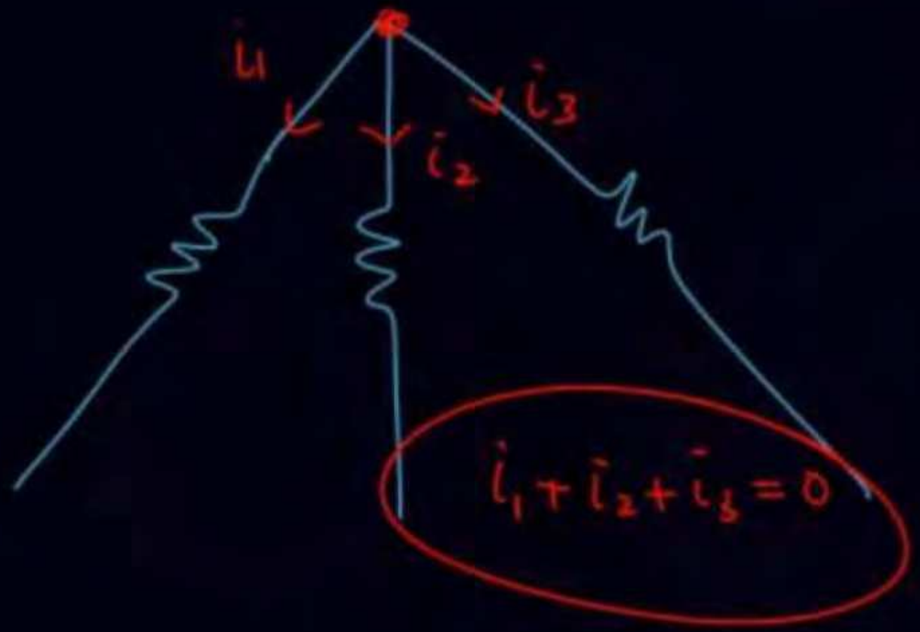
$$2 + 3 + 4 + i_4 = 0$$

$$i_4 = -9$$

काम का Jxn Law

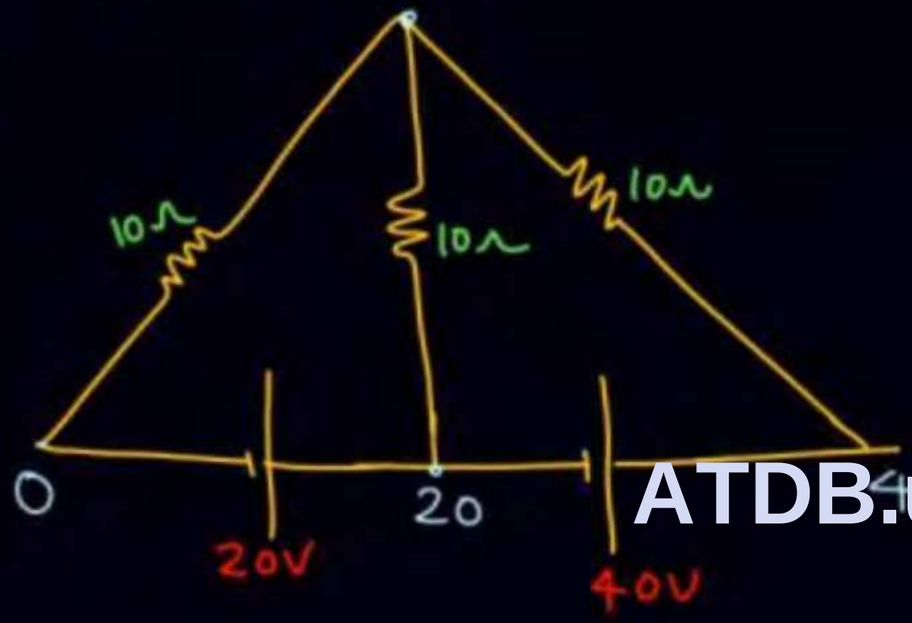


$$i_1 + i_2 + i_3 + i_4 = 0$$

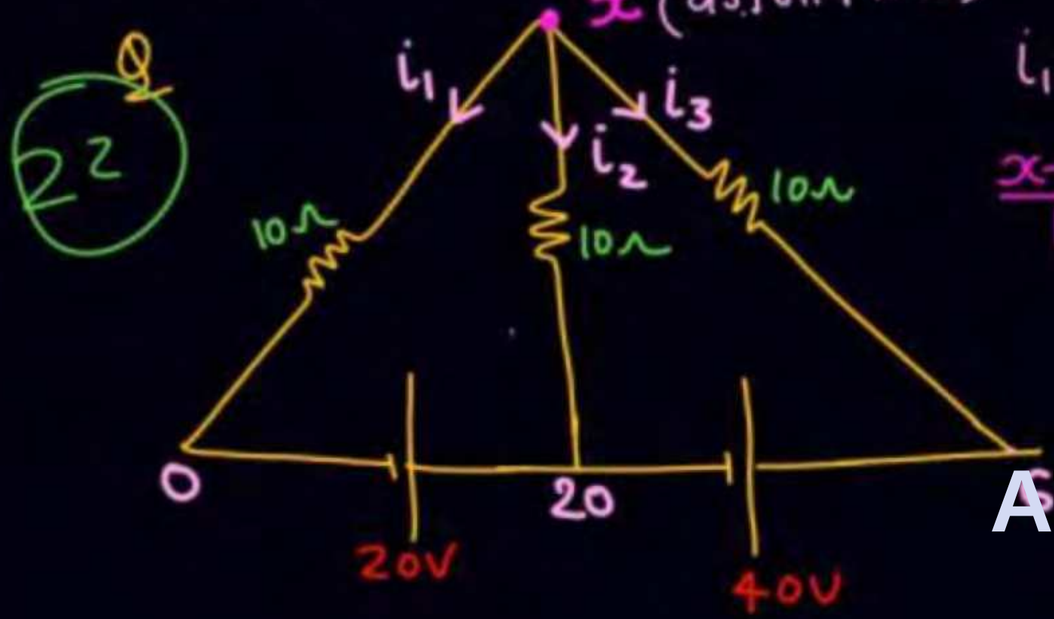


फंसने वाले सवाल

Q 22



फंसने वाले सवाल

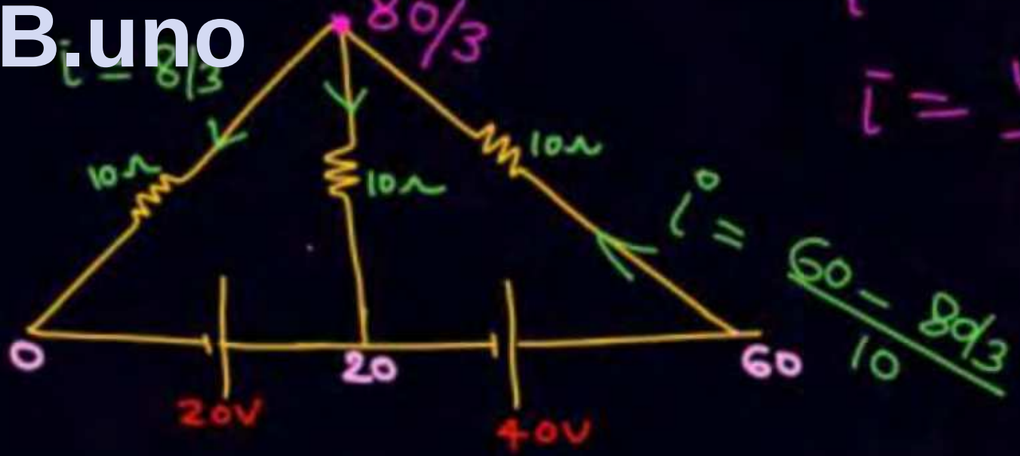


$$i_1 + i_2 + i_3 = 0$$

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

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

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

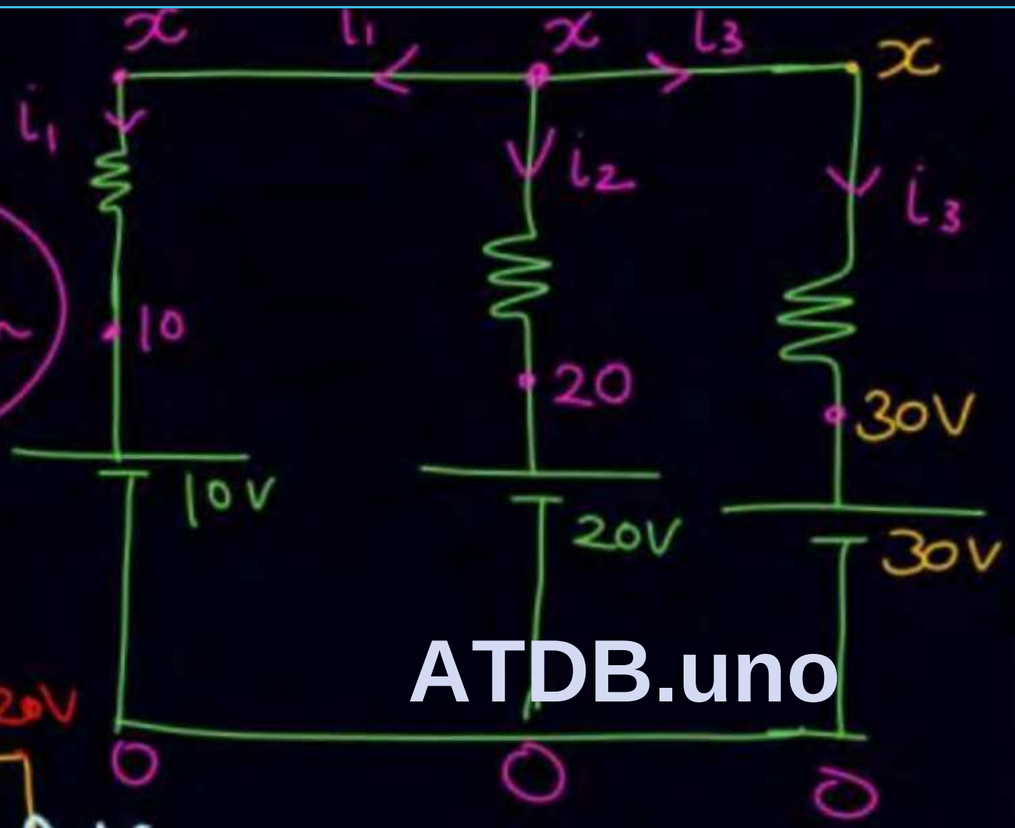


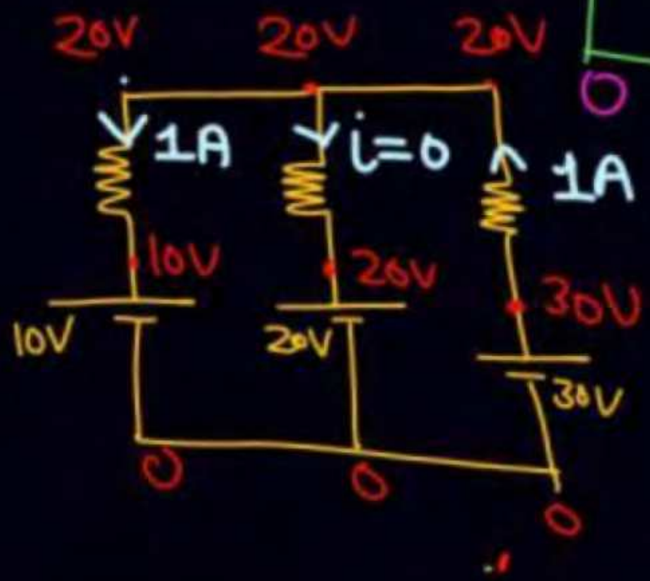
$i = 8/3$

$$i = \frac{60 - 80/3}{10}$$

Q 2B

$R = 10\,\Omega$ each



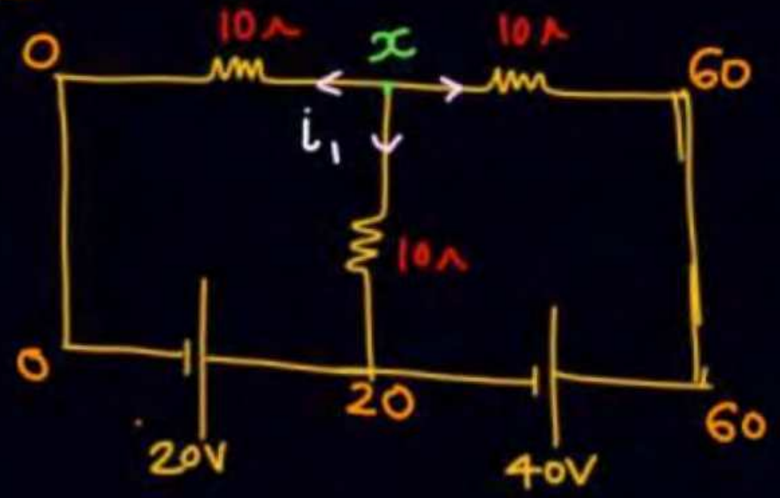


$$i_1 + i_2 + i_3 = 0$$

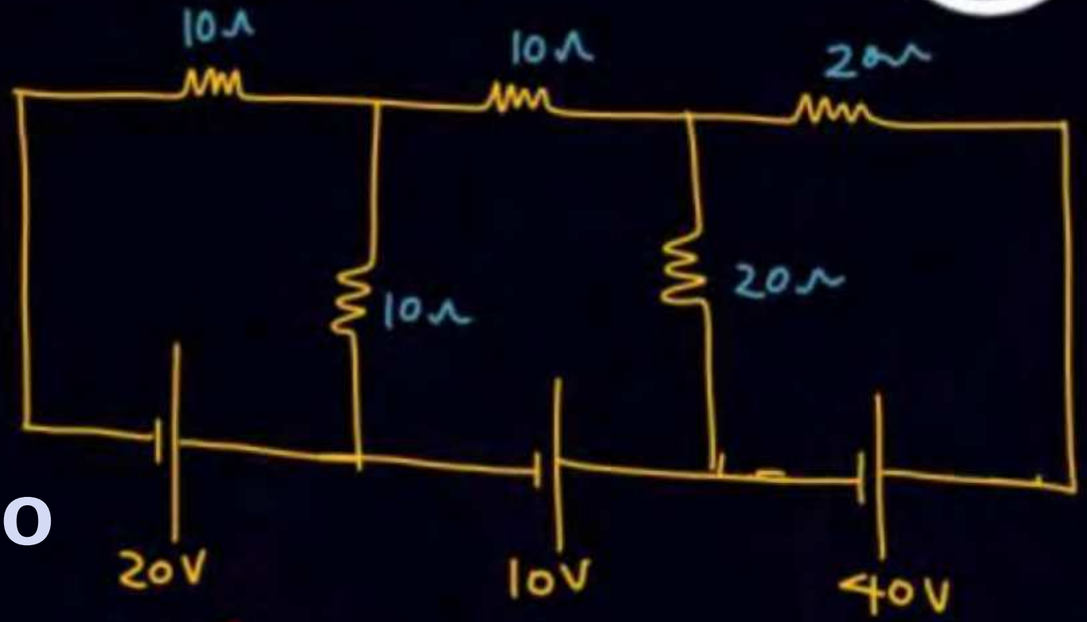
$$\frac{x-10}{10} + \frac{x-20}{10} + \frac{x-30}{10} = 0$$

$x = 20$

24 Q



25 (tough) Q



$i_1 + i_2 + i_3 = 0$

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

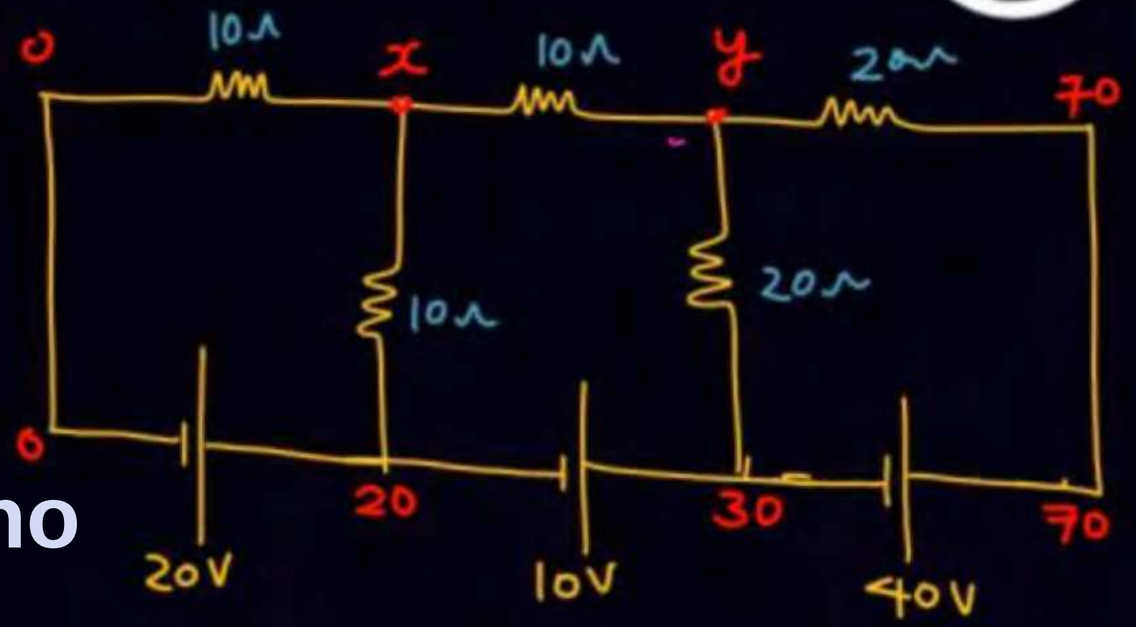
$x = 80/3$

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

(next page)

25 (tough)

Q



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

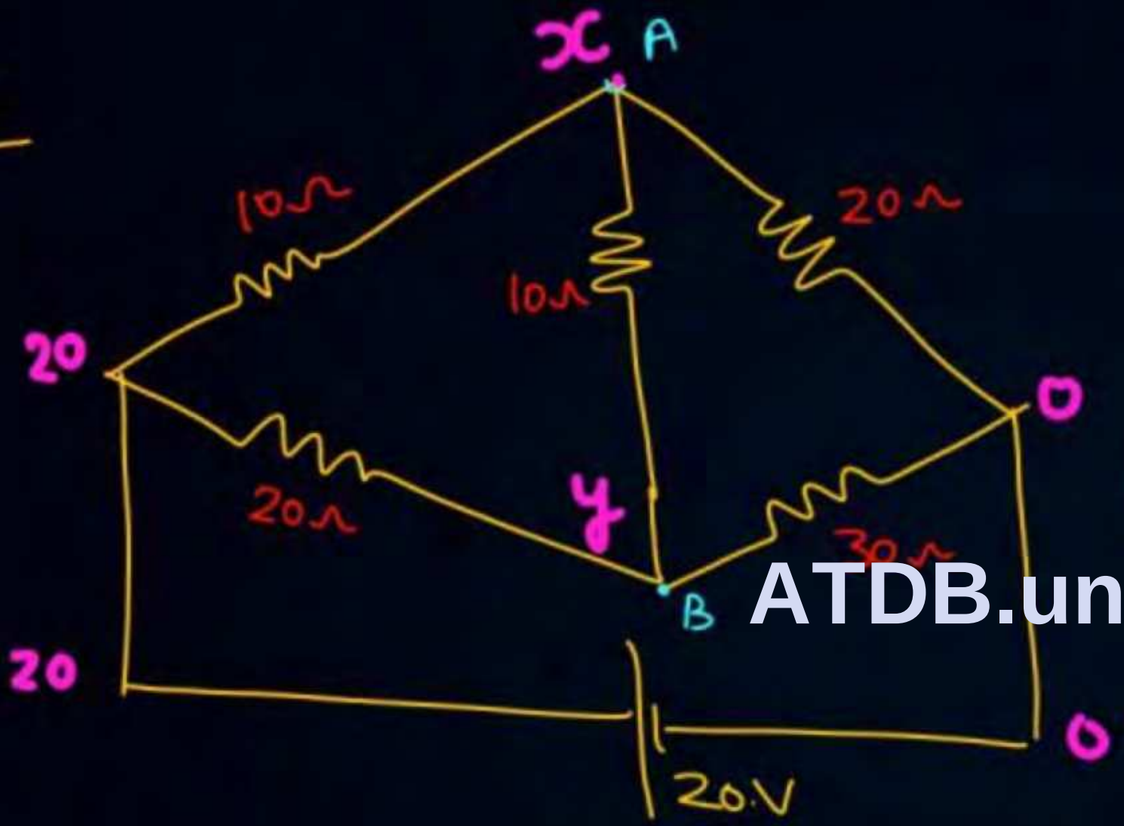
$$\boxed{3x-y=20} \quad \text{——} (1)$$

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

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

$$\boxed{4y-2x=100} \quad \text{——} (2)$$

Q

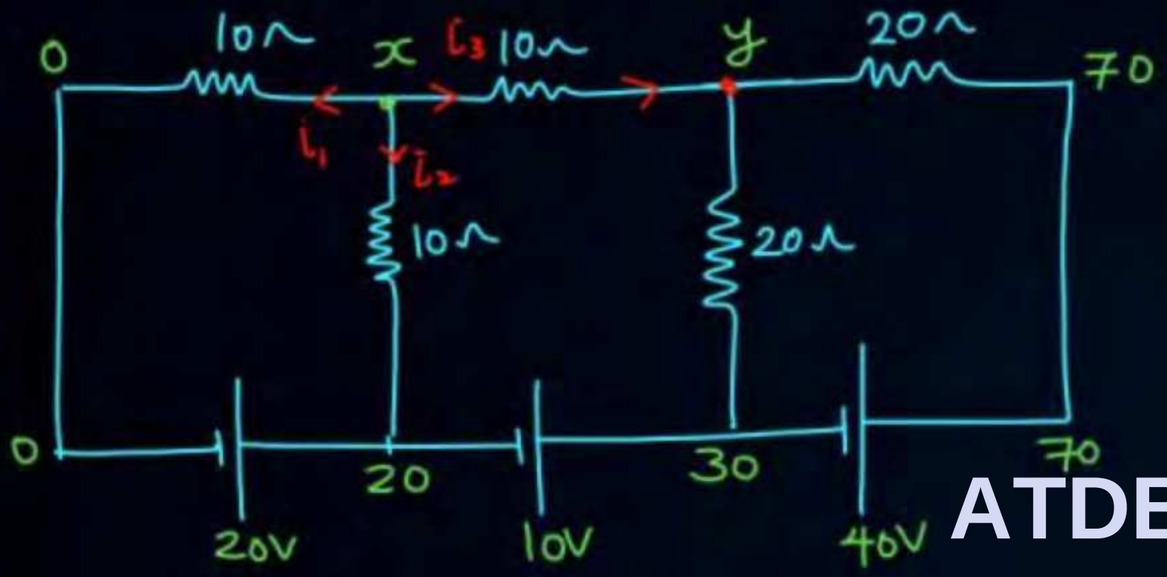


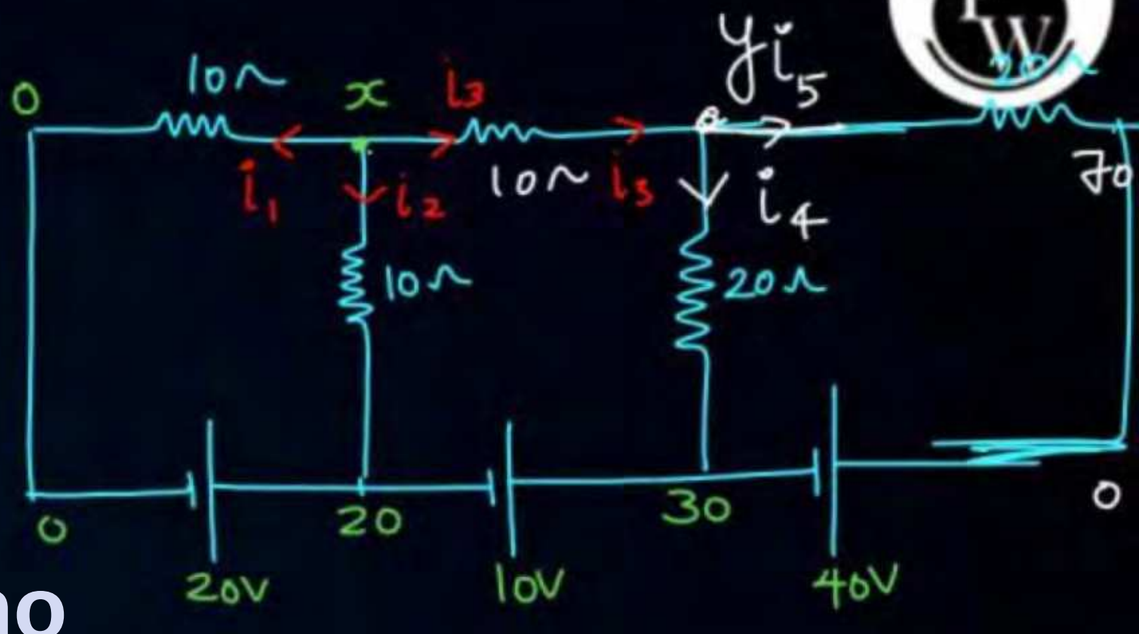
find $V_A - V_B = ?$

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

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

SKC





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

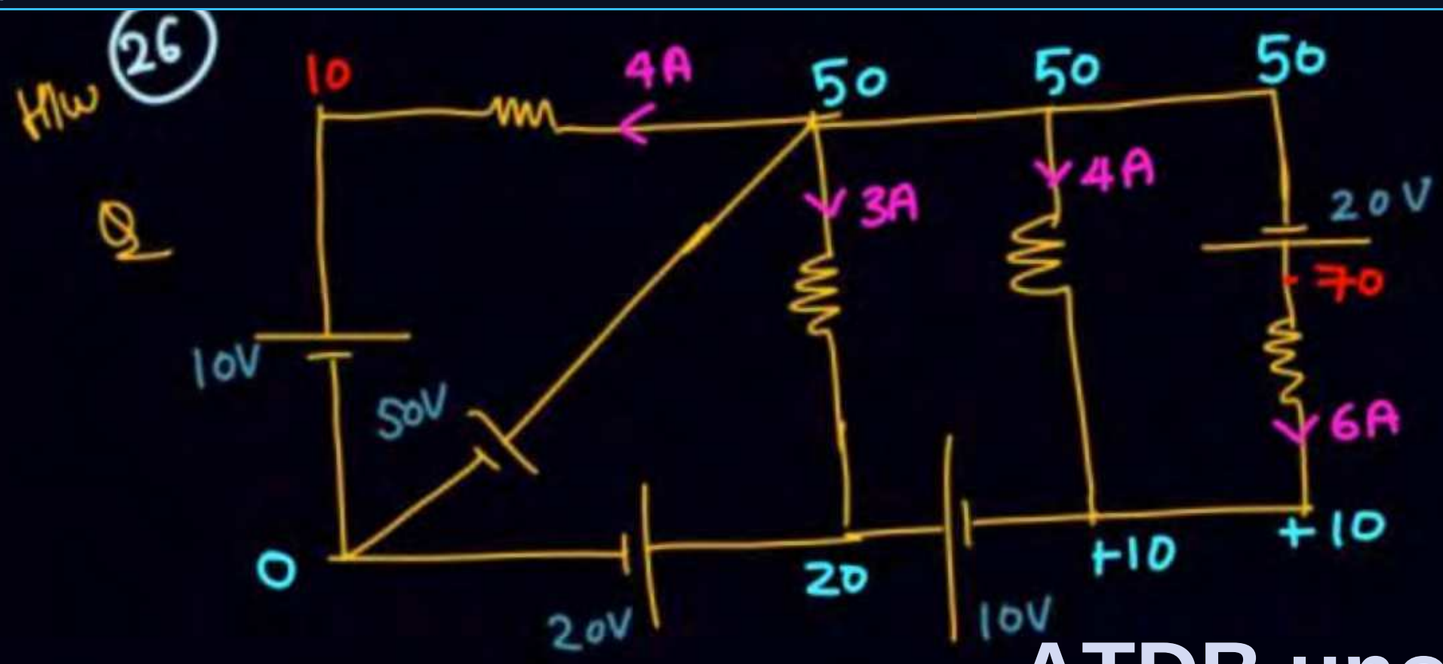
$$\frac{y-x}{10}+\frac{y-30}{20}+\frac{y-70}{20}=0$$

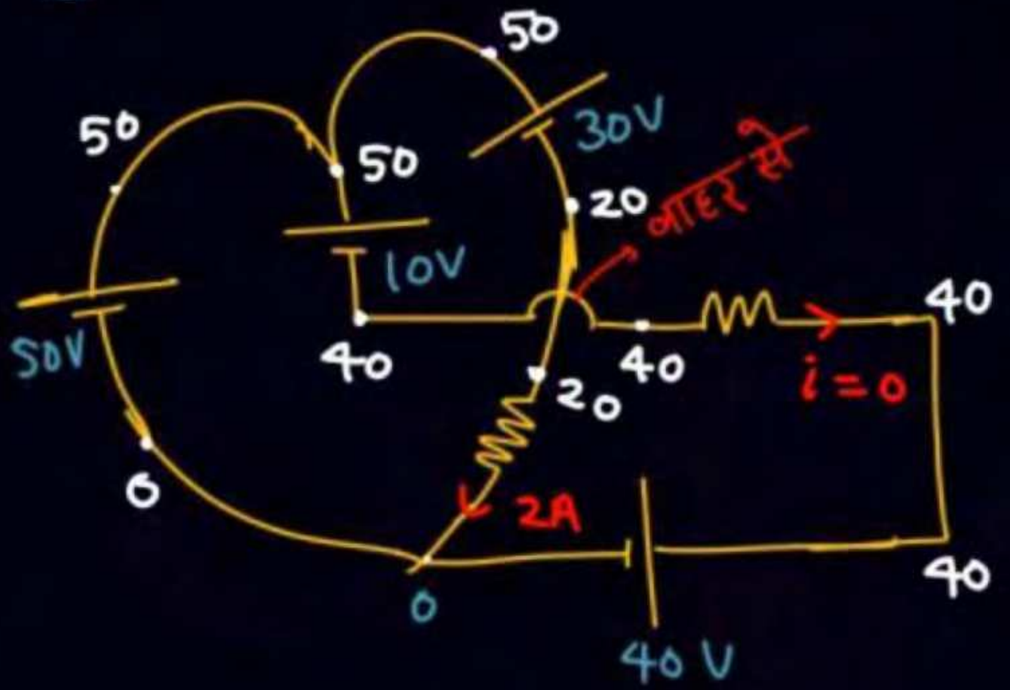
$$i_1+i_2+i_3=0 \Rightarrow \frac{x-0}{10}+\frac{x-20}{10}+\frac{x-y}{10}=0$$

$$i_3=i_4+i_5$$

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

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





28

Q

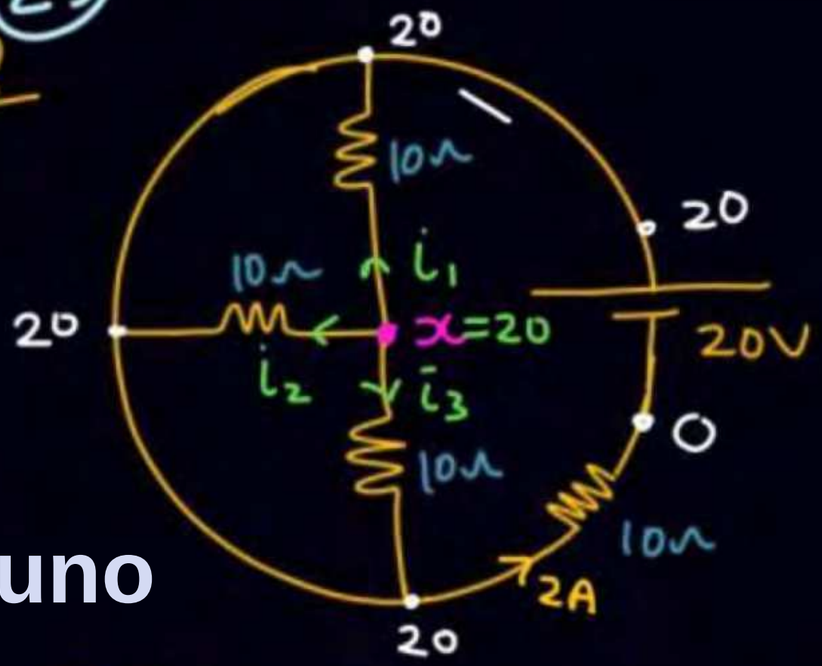
$$\frac{x-20}{10}+\frac{x-50}{10}+\frac{x+30}{10}=0$$

$$x = 40/3$$

R = 10Ω (each)

29

Q



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

$$i_1 = i_2 = i_3 = 0$$

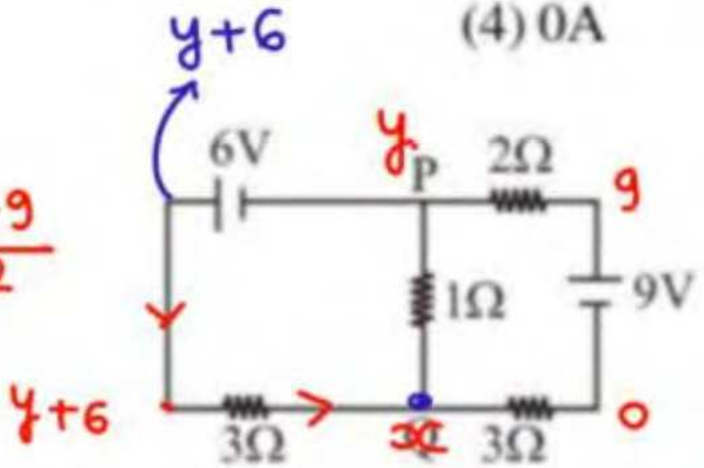
$$\frac{x-0}{10}+\frac{x-10}{10}+\frac{x-0}{10}+\frac{x-y}{10}=0 \quad \equiv$$

$$4x-y=10$$
$$3y-x=20$$

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

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



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

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

$$\Delta w = \frac{x-y}{1}$$

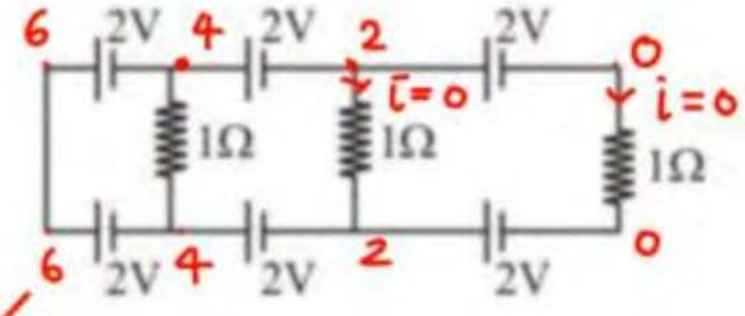
दर्शाये गये परिपथ में 1Ω प्रतिरोधक से प्रवाहित धारा होगी :- [JEE-Main 2015]

(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)

32

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

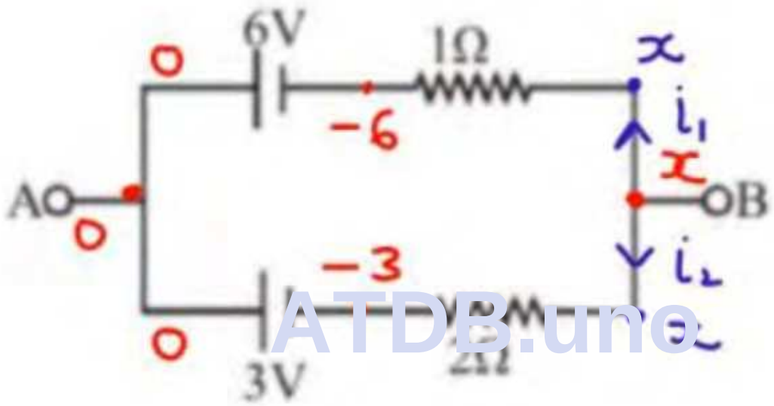


(1) 0.5 A (2) 0 A (3) 1 A (4) 0.25 A

Ans. (2)

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

34

the figure. The current in resistance R_2 would be zero if :- **[JEE Advanced 2014]**

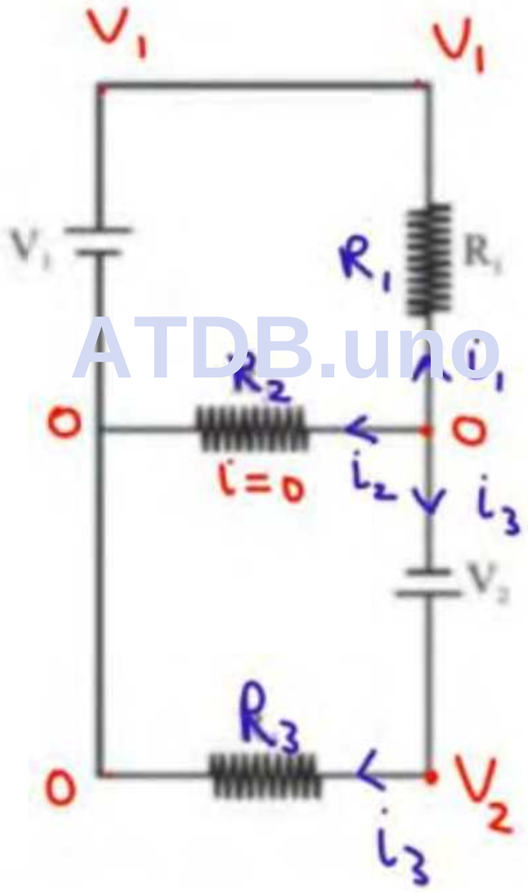
(A) $V_1 = V_2$ and $R_1 = R_2 = R_3$

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

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

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

R_2 कितना भी हो फर्क नहीं पड़ता



$i_1 + i_2 + i_3 = 0$

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

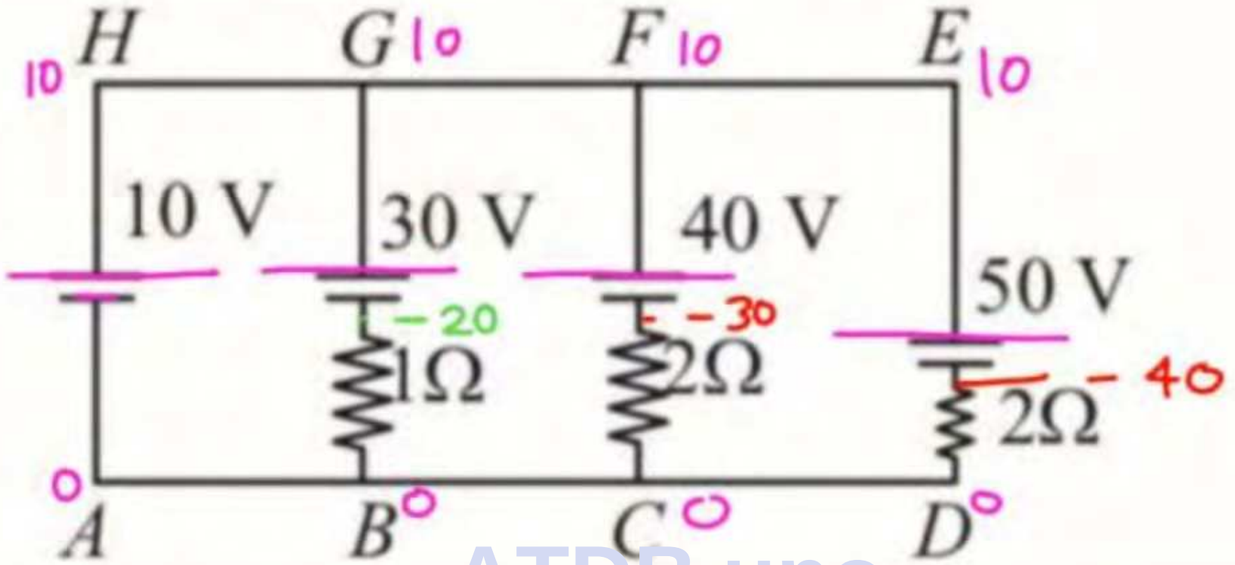
$$\frac{V_1}{R_1} = \frac{V_2}{R_3}$$

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

$$R_3 = 2R_1$$

Example 2: Find the current in each wire.

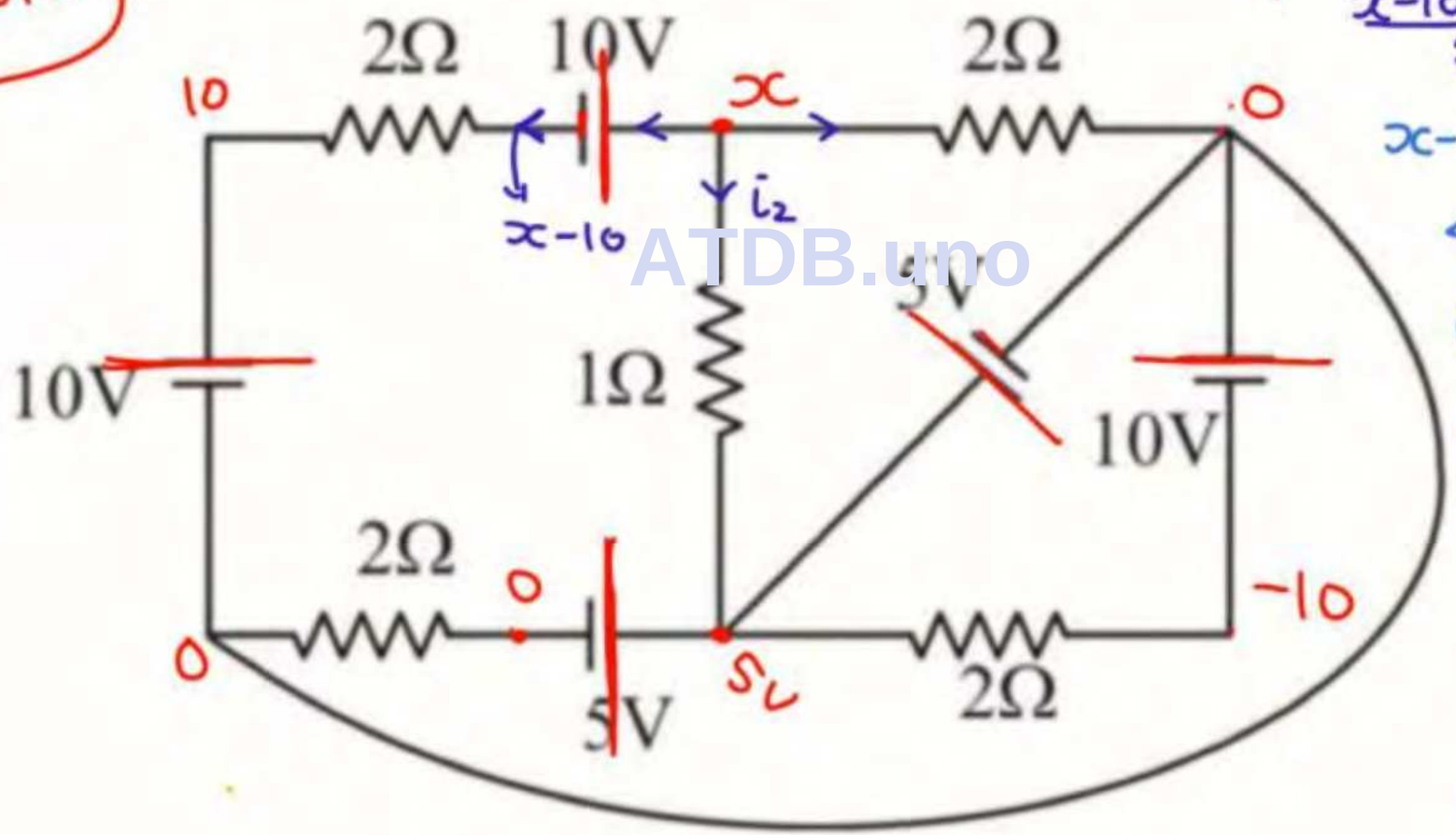
35



36

Example 12: 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

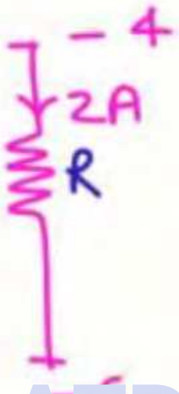
through 4 Ω will be zero?

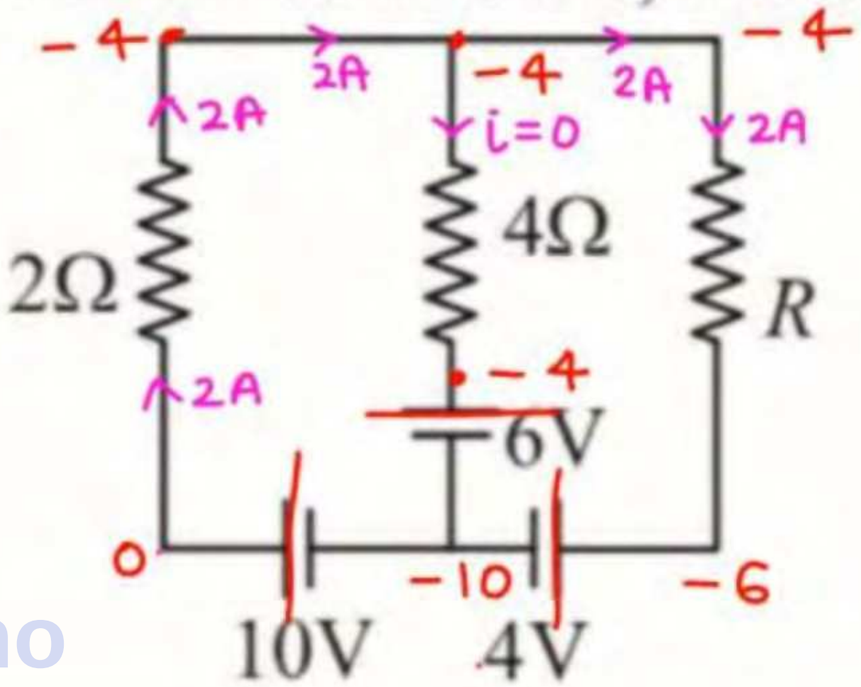
(a) 1 Ω

(b) 2 Ω

(c) 3 Ω

(d) 4 Ω





$V = iR$

$2 = 2 \times R$

38

4. Find the currents I, I_1 and I_2 (all in amperes) for the circuit shown.

(a) 2, 1 and 1

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

(c) $\frac{3}{2}, \frac{1}{2}$ and 1

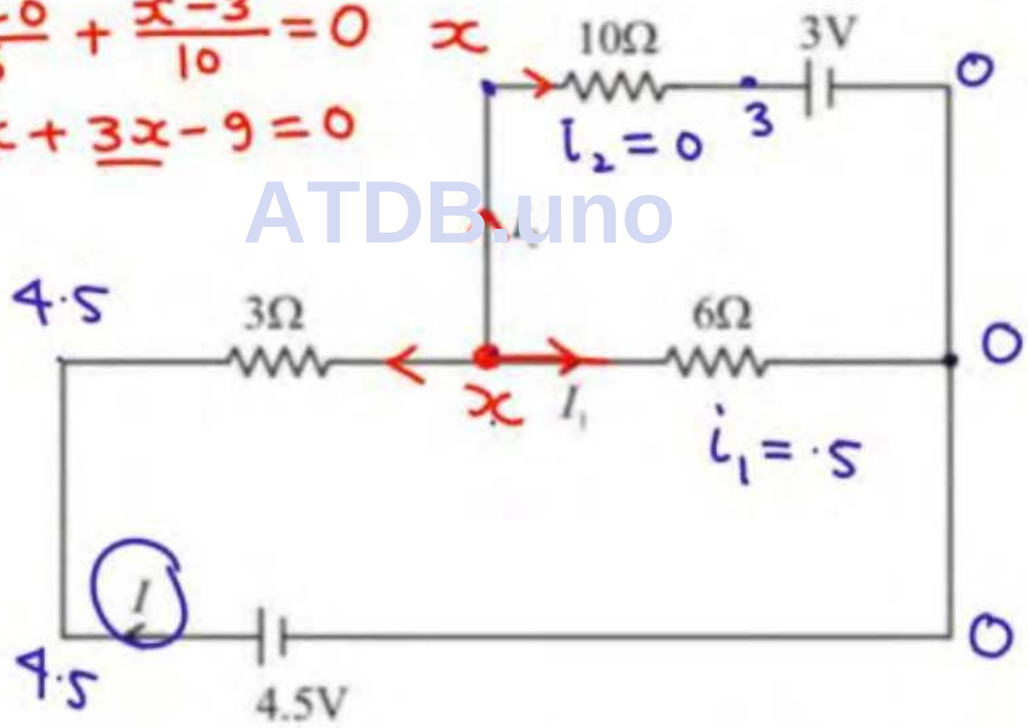
(d) $\frac{1}{2}$, 0 and $\frac{1}{2}$

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

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

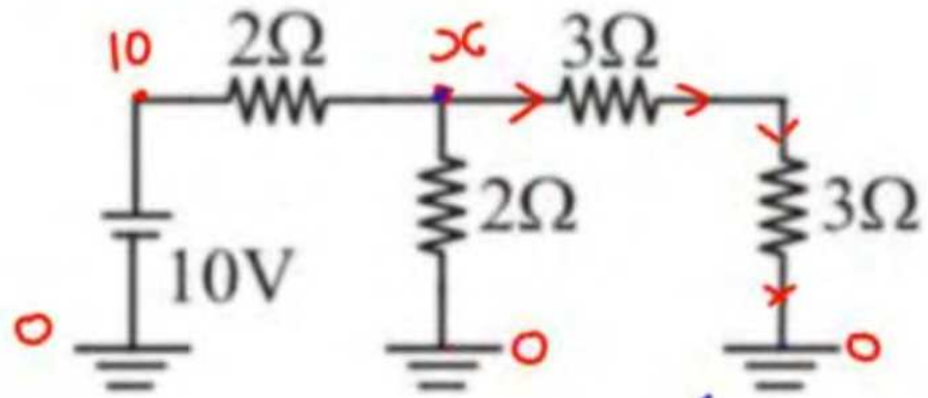
$18x = 54$

$x = 3$

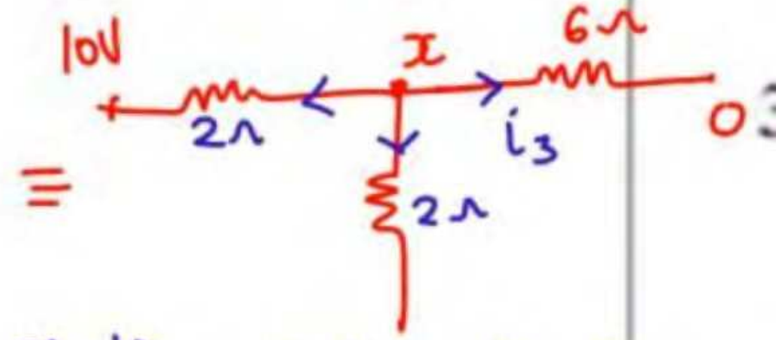


(JEE Lakshya Physics M-1)

39. Current in 3 Ω resistance is



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



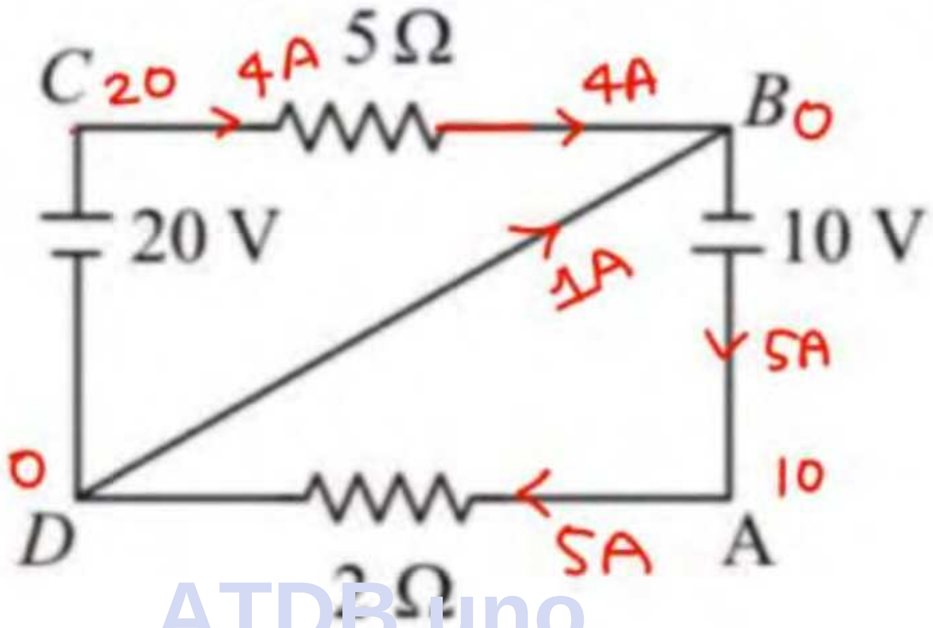
$$\frac{x-10}{2} + \frac{x-0}{2} + 0 + \frac{x-0}{6} = 0$$

(a) 1 A (b) $\frac{1}{7}$ A (c) $\frac{5}{7}$ A (d) $\frac{15}{7}$ A

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

$$x = \frac{30}{7}$$

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

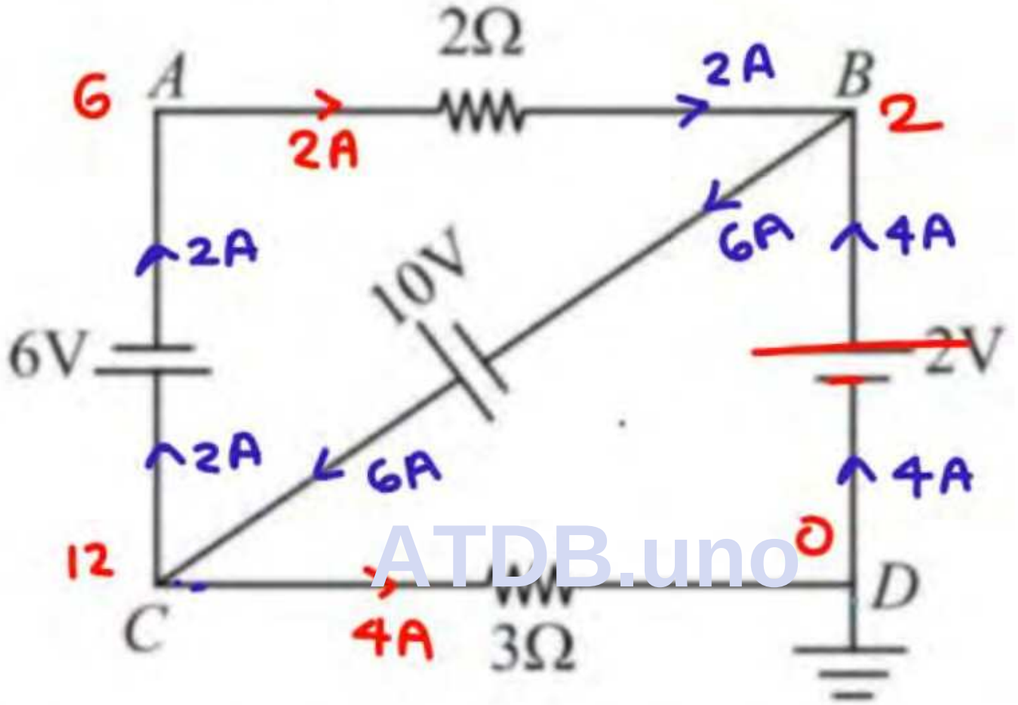


(a) 1A (b) 2A

(c) 3A (d) 4A

(JEE Lakshya Physics M-1)

41. In the shown circuit



(a) current passing through 2 Ω resistance is 2 A

(b) current passing through 3 Ω resistance is 4 A

(c) current in the wire between D to earth is zero

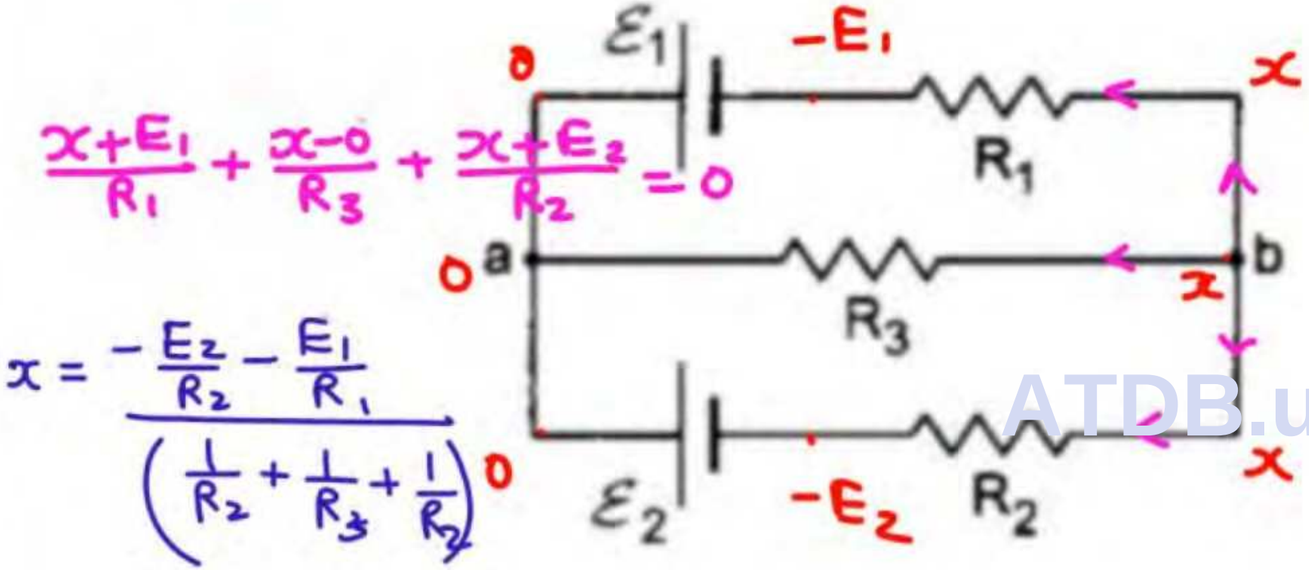
(d) potential of point A is 10 V

(JEE Lakshya Physics M-1)

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

42

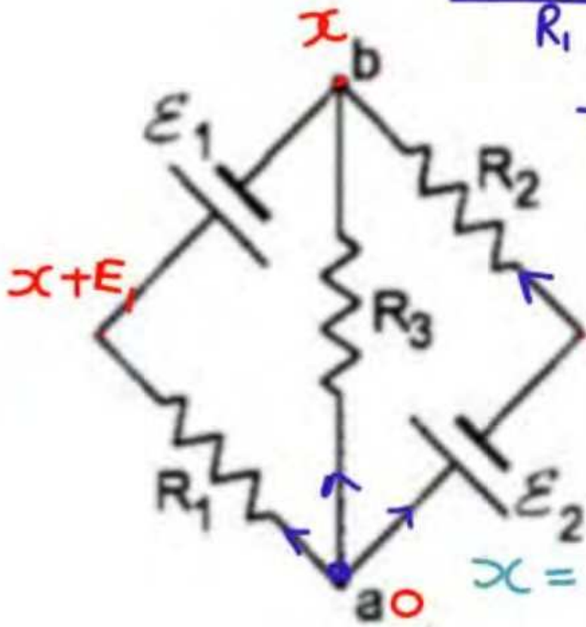
0 - x Ans



$$\frac{x+E_1}{R_1} + \frac{x-0}{R_3} + \frac{x+E_2}{R_2} = 0$$

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

(a)



$$\frac{0-(x+E_1)}{R_1} + \frac{0-x}{R_3} + \frac{(-E)-x}{R_2} = 0$$

$$x = \frac{-\frac{E_1}{R_1} - \frac{E_2}{R_2}}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3}}$$

(b)

Ans 0 - x

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

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

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

$$18x=54$$

$$x=3$$

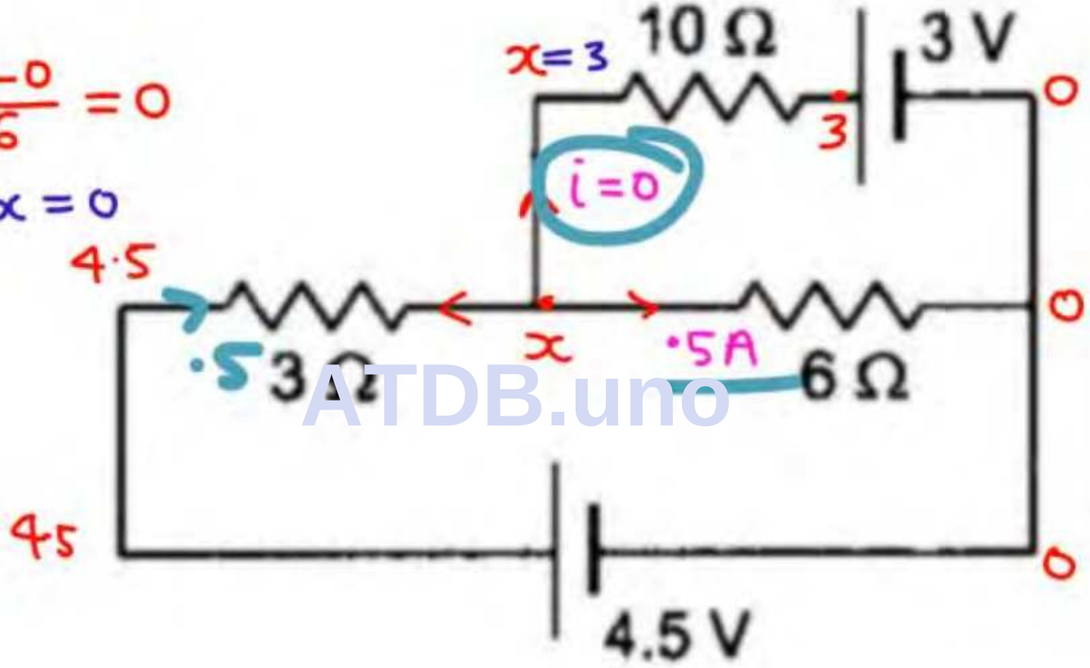


Figure 32-E14

44 HCV

$\mathcal{E}_2 = 2\ \text{V}$, $\mathcal{E}_3 = 1\ \text{V}$ 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.

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

$x = 2$

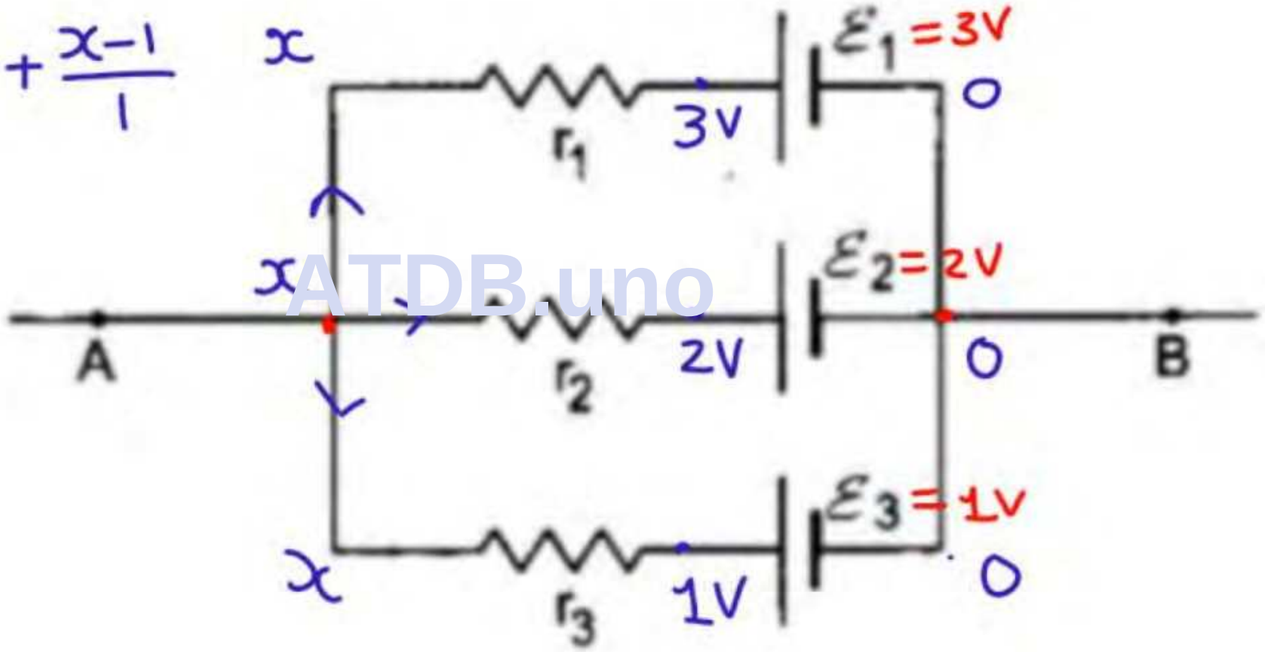
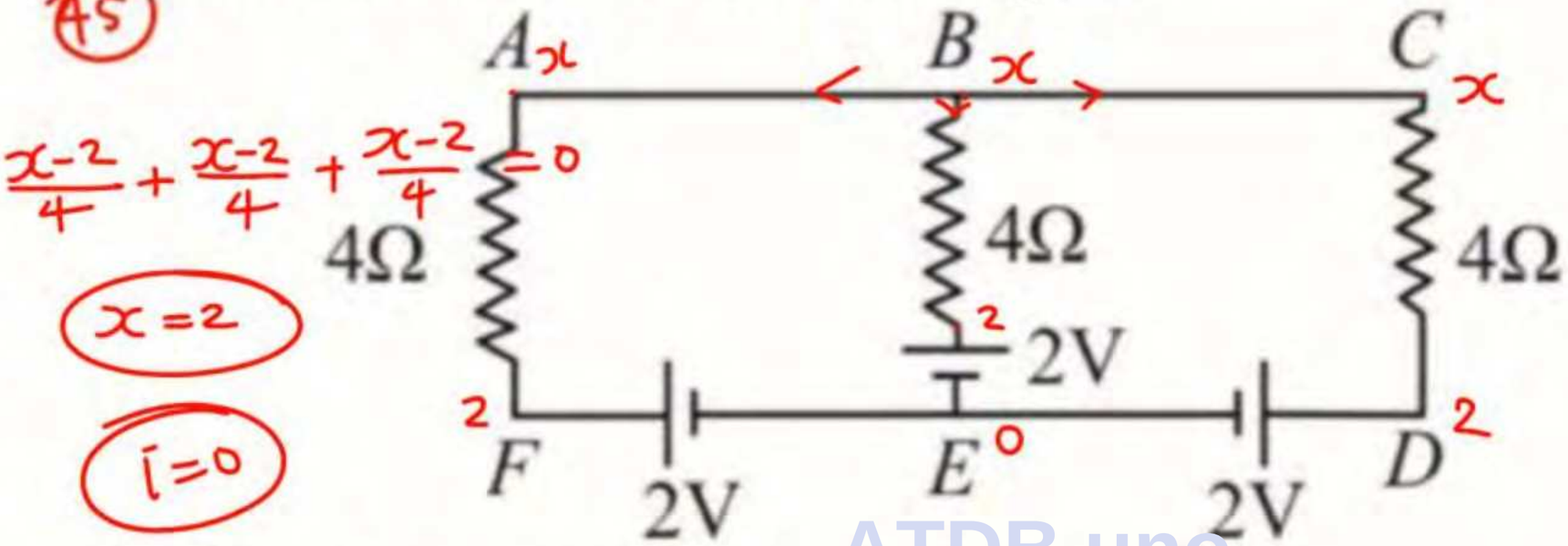


Figure 32-E13

Q. In the circuit shown in figure

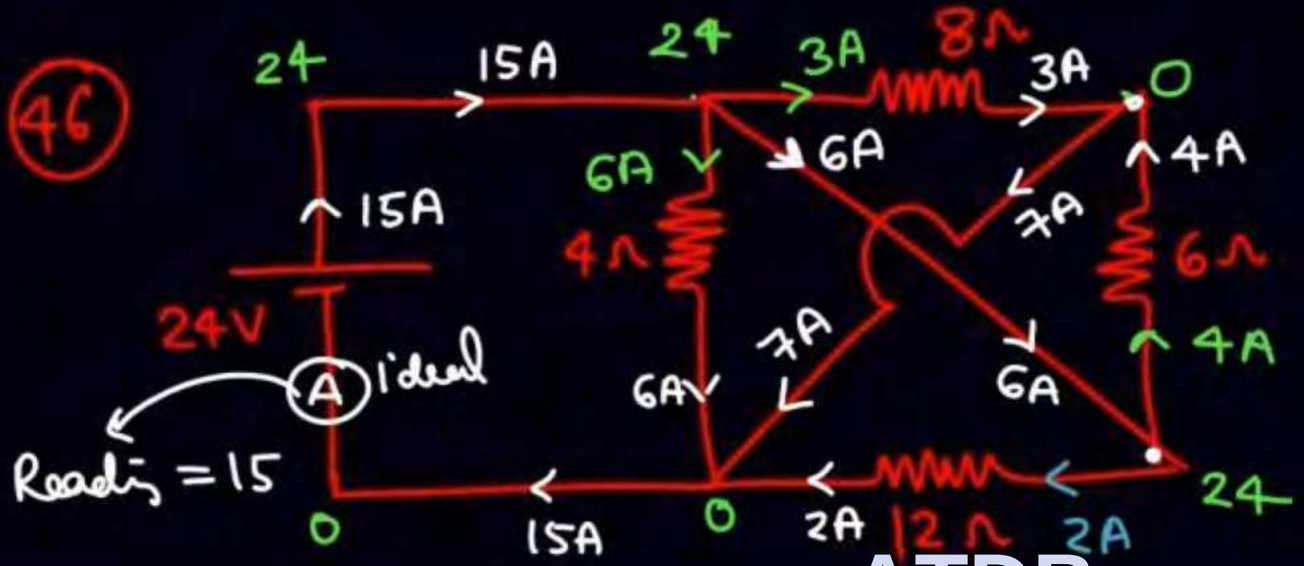


(a) Current in wire AF is 1A

(b) Current in wire CD is 1A

(c) Current in wire BE is 2A

(d) None of these



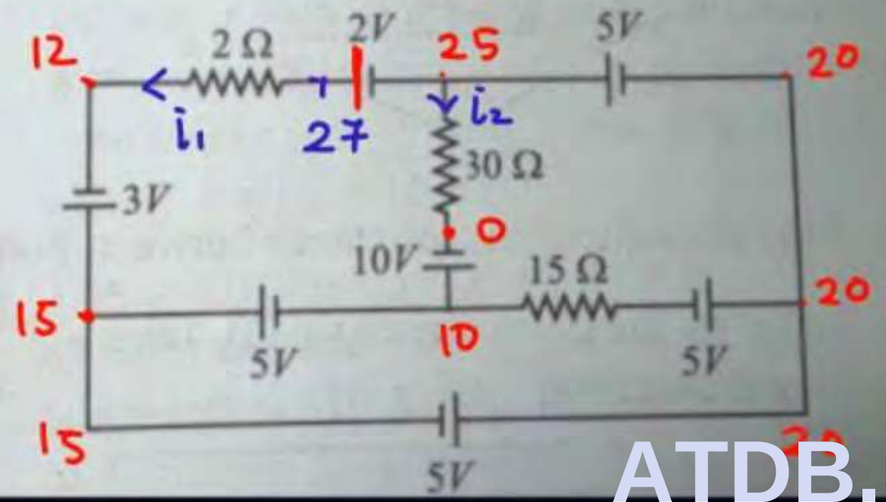
μF capacitor

$10q_2$) (in μc).

1Ω

47

In the circuit shown, current through the resistance 2 Ω is i_1 and current through the resistance 30 Ω is i_2. Find the ratio i_1 / i_2.

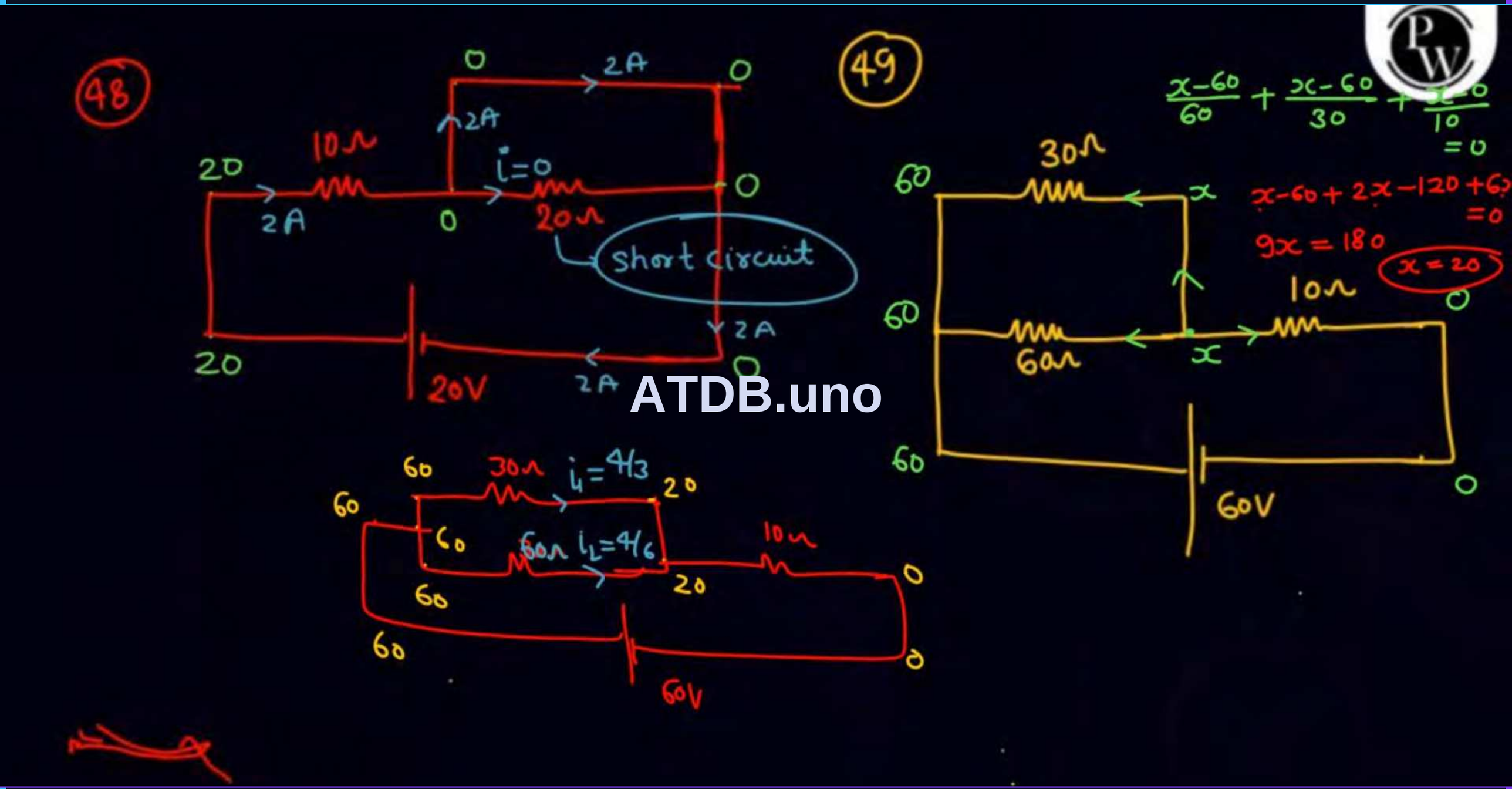


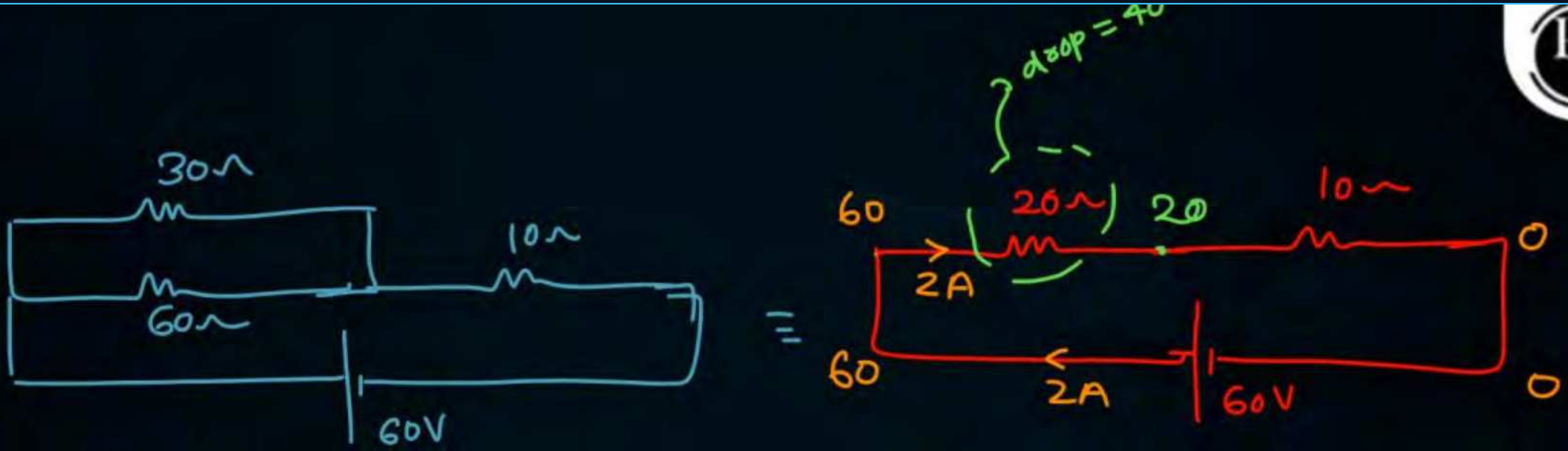
$i_1 = \frac{15}{2}$

$i_2 = \frac{25}{30}$

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

Ans 9

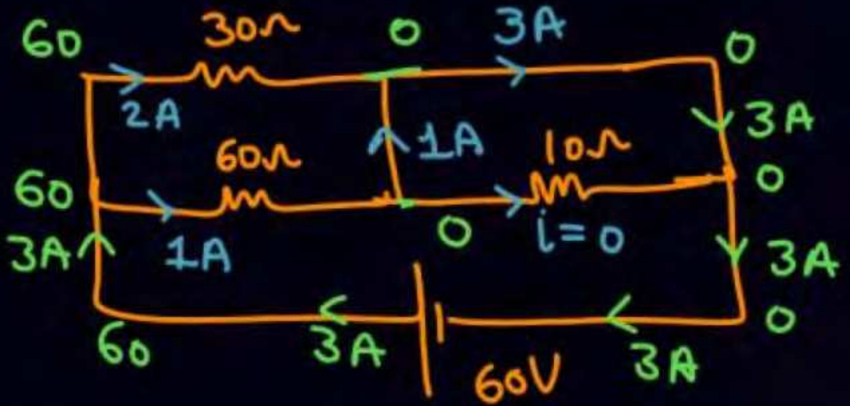




ATDB.uno

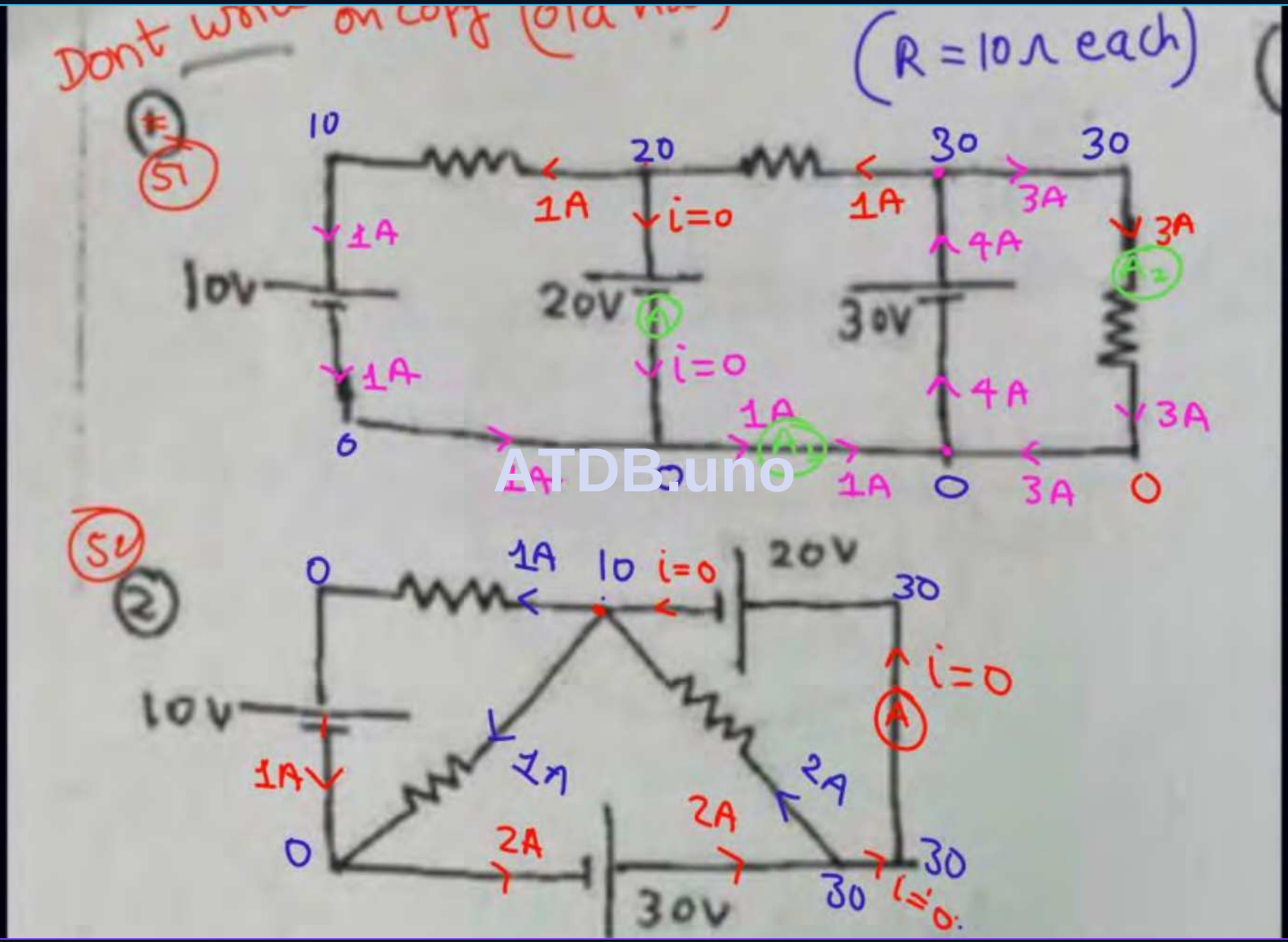
(50)

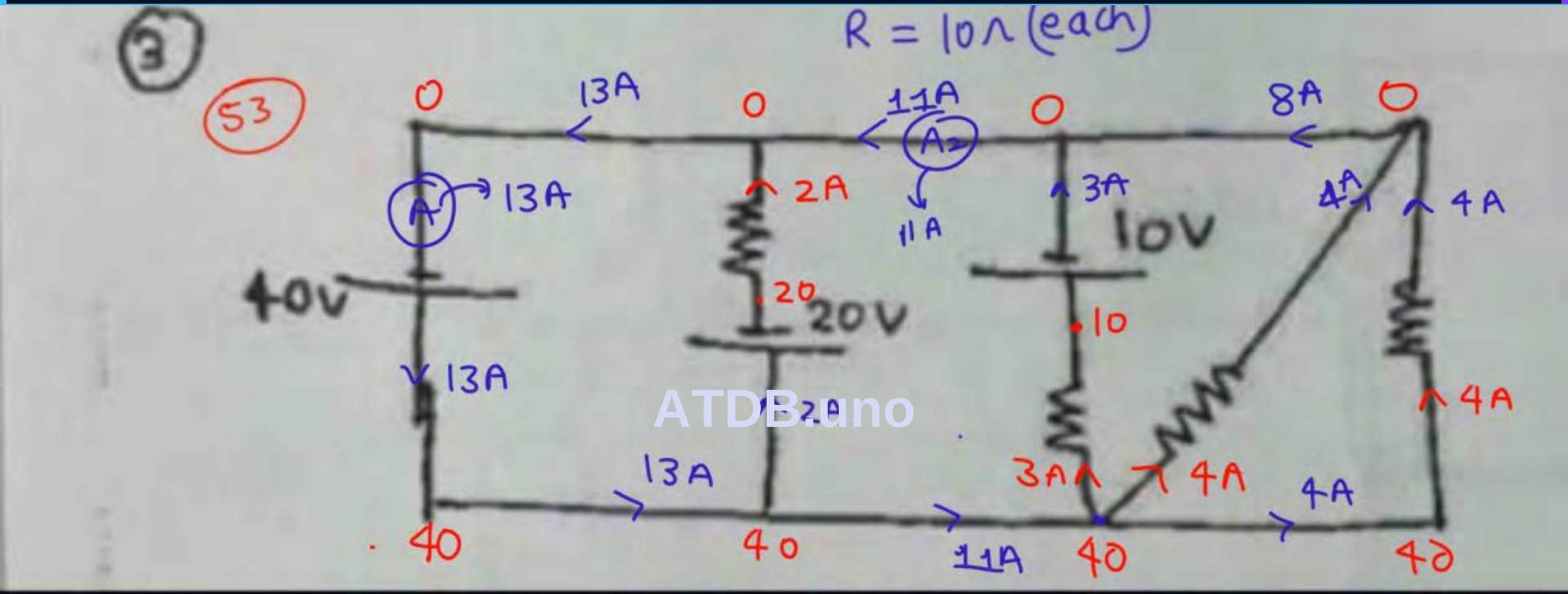
Find ratio of current through 30Ω before switch close to after switch close

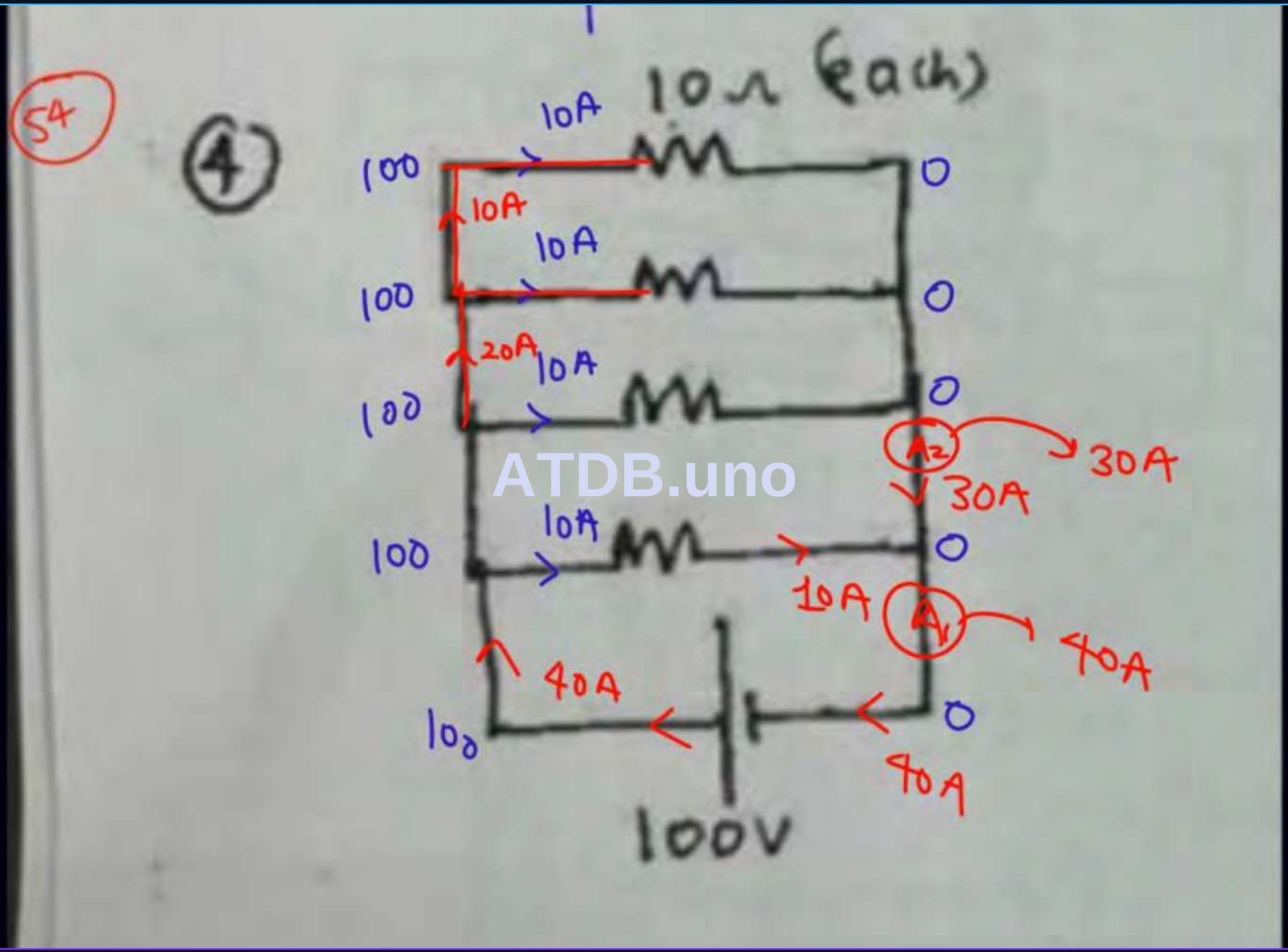


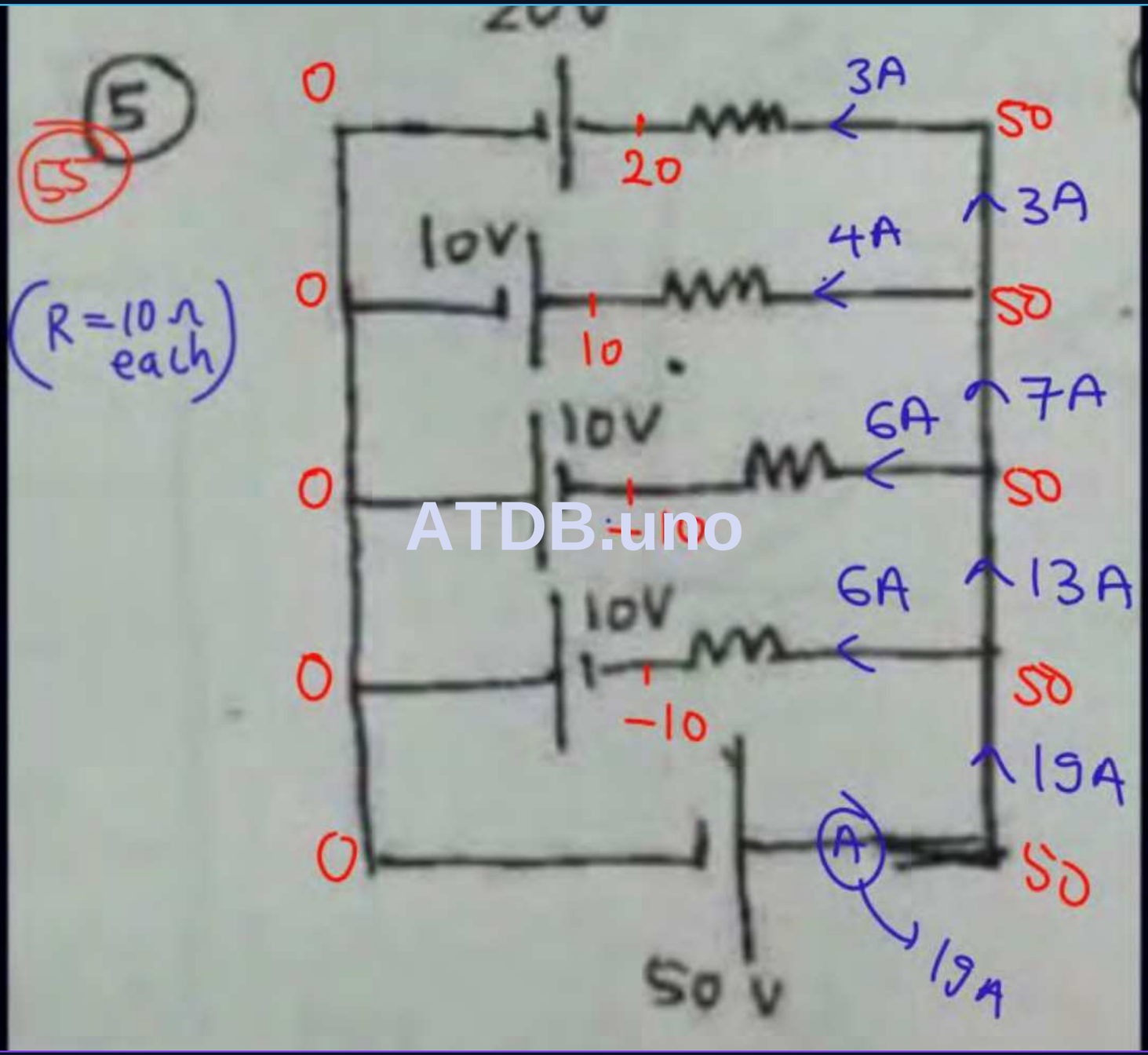
$$i_1 = \frac{60}{30+60} \times 2 = \frac{120}{90} = \frac{4}{3}$$

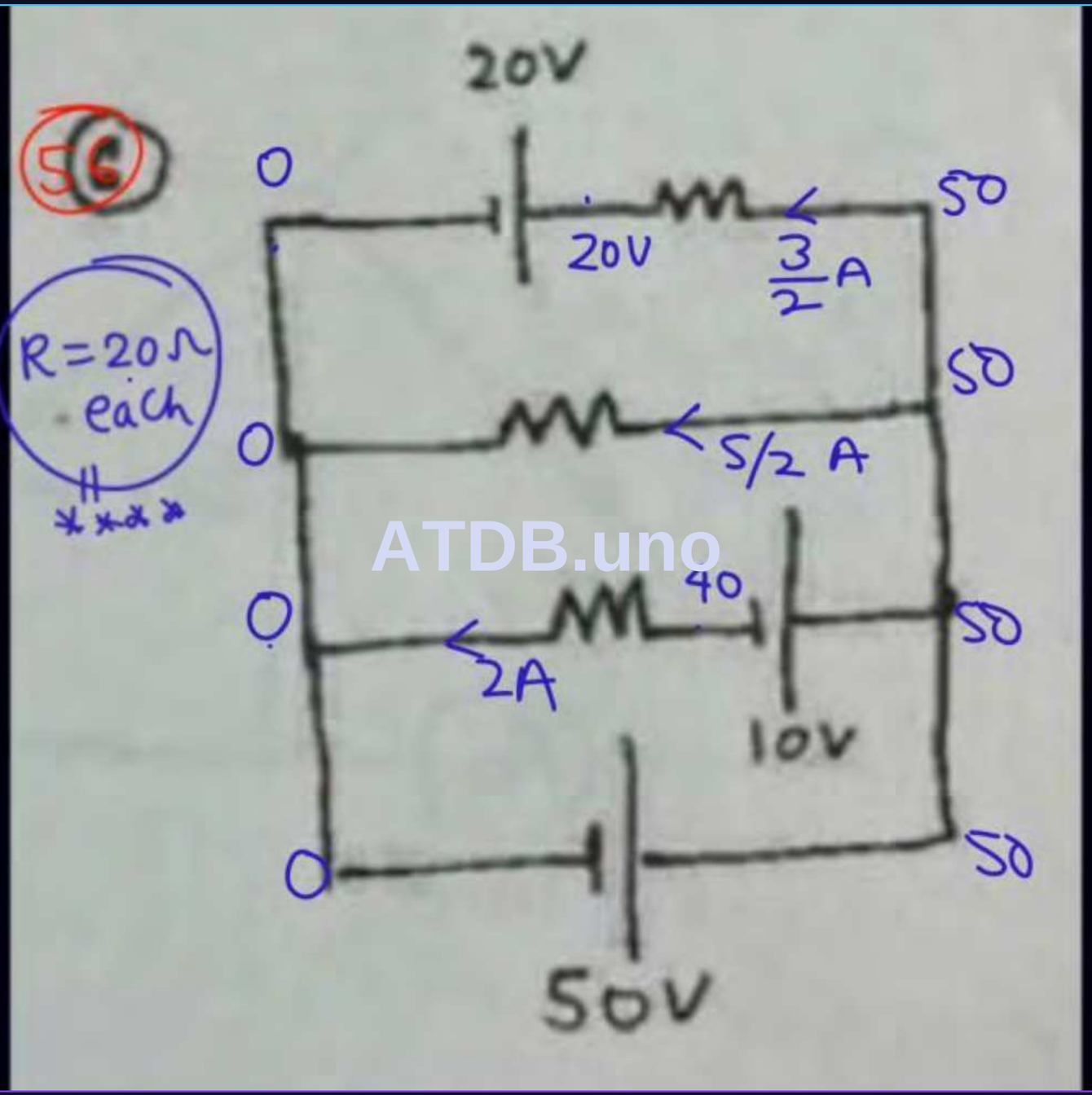
Ans $$\frac{(i_1)_i}{(i_1)_f} = \frac{4/3}{2} = \frac{4}{6}$$

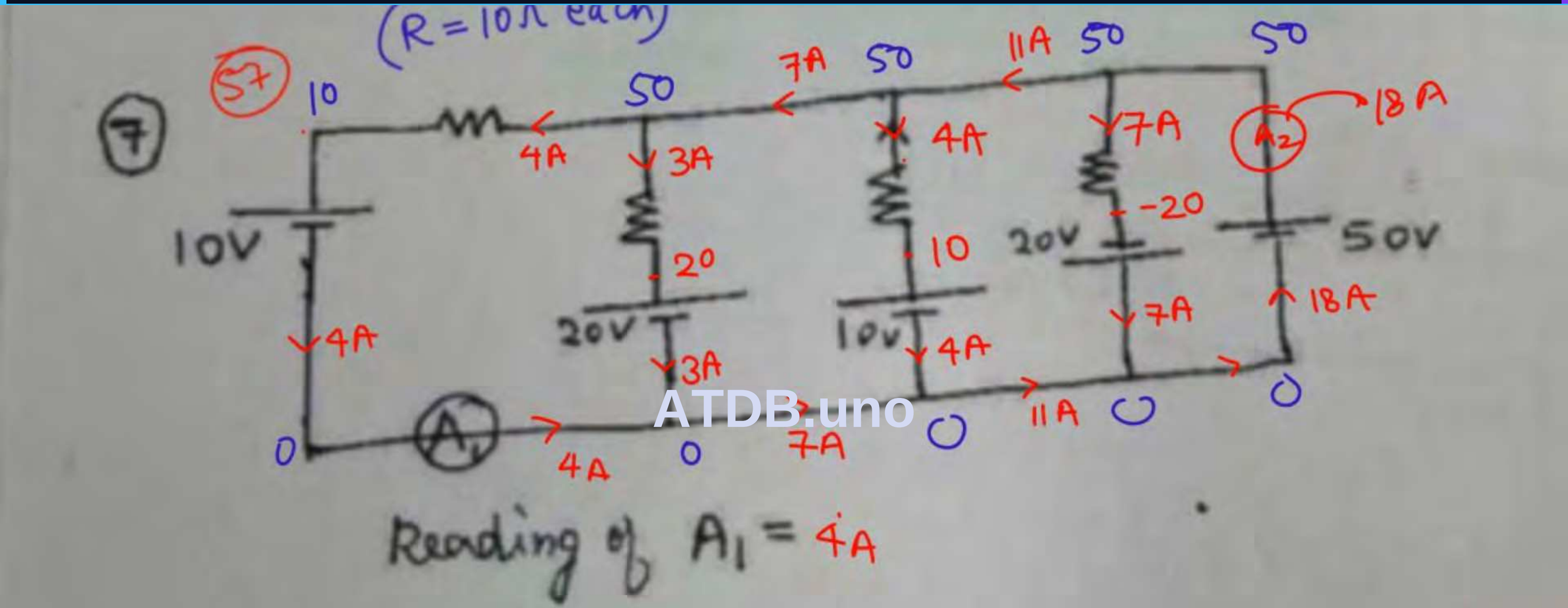




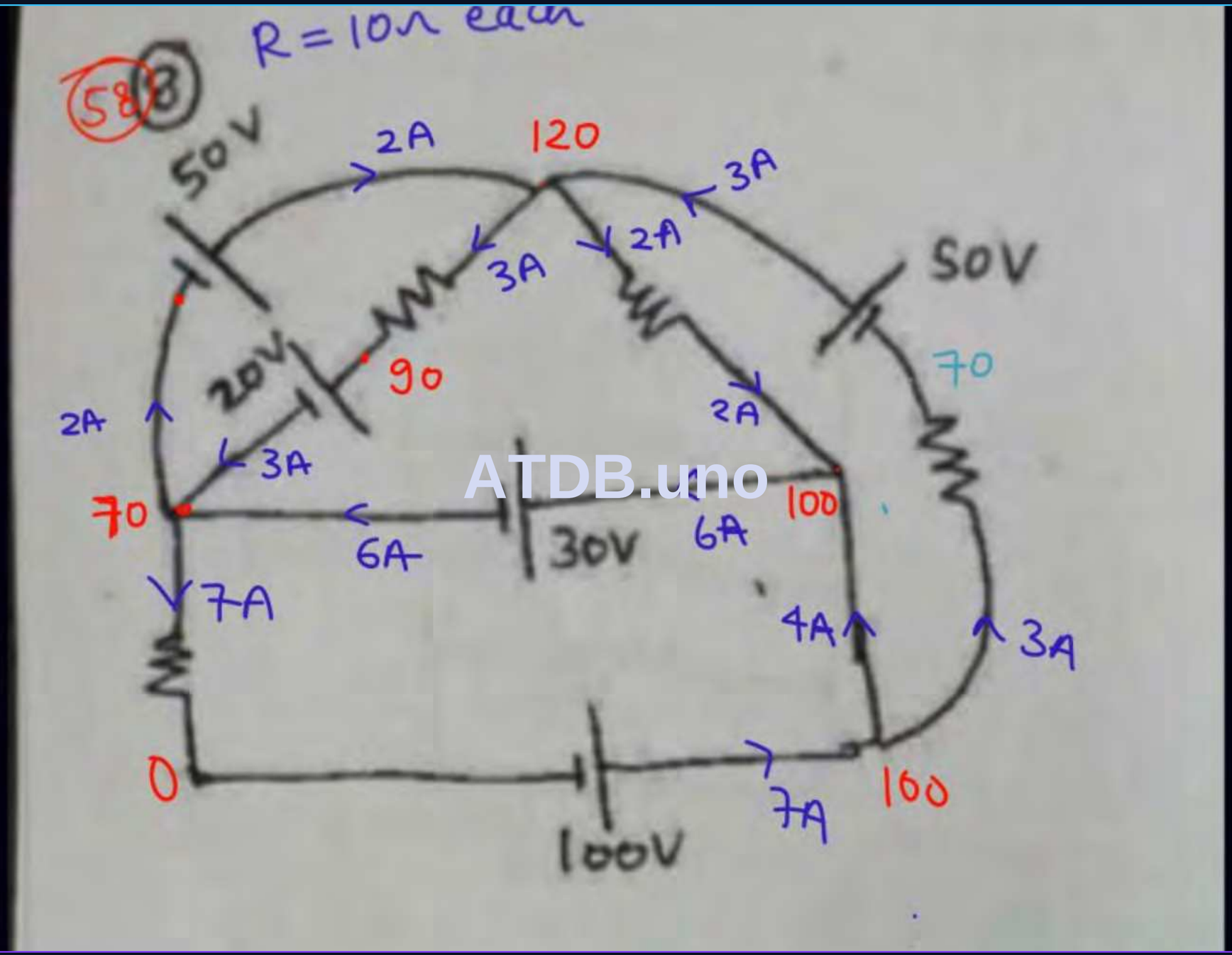


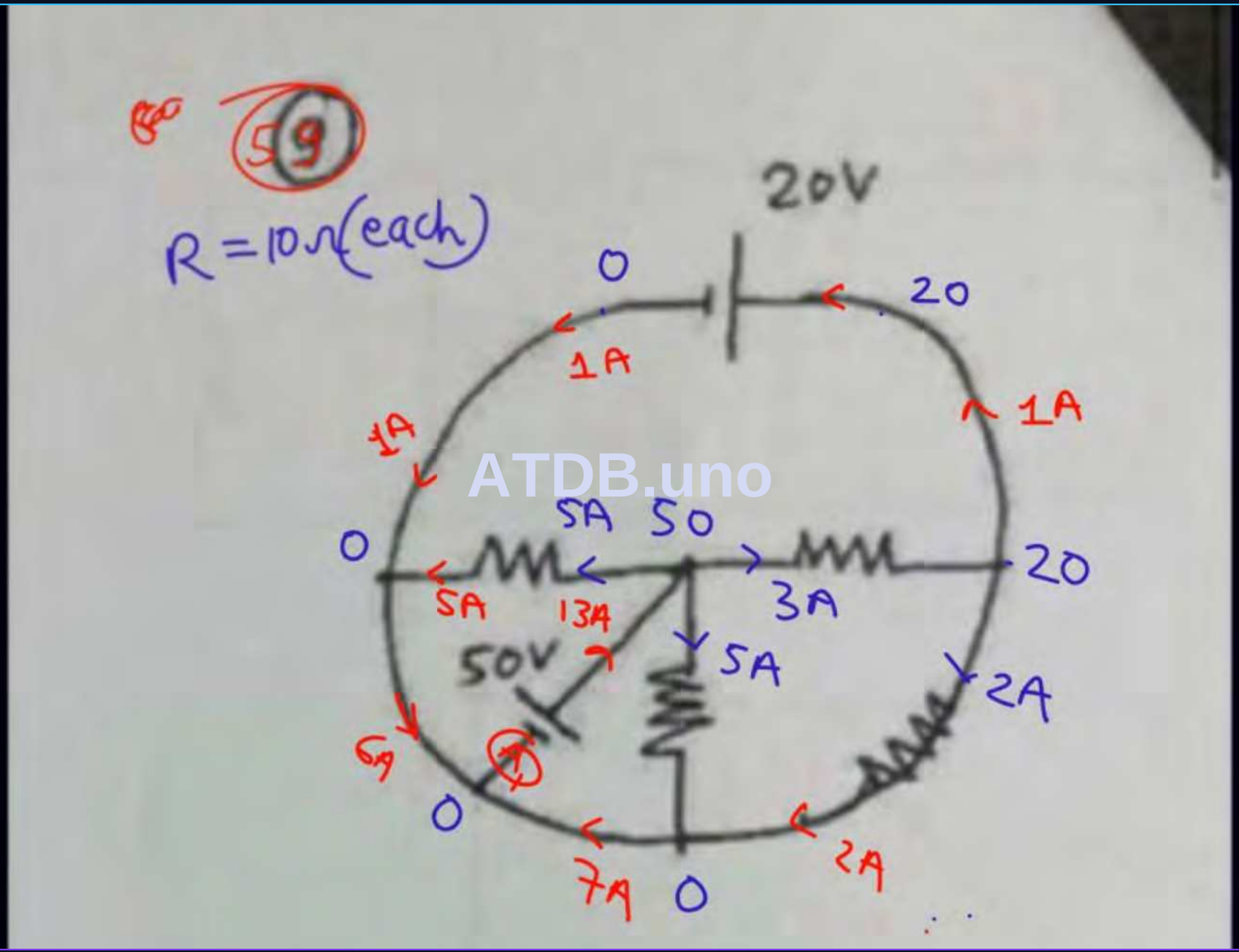


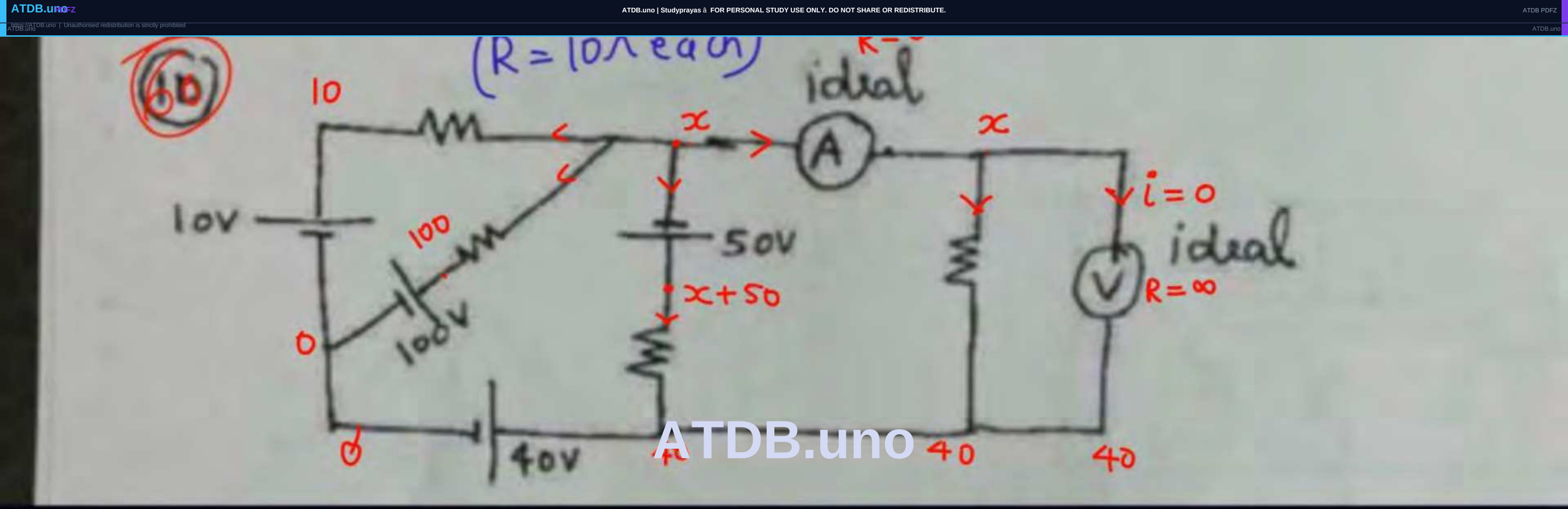




Reading of $A_1 = 4A$

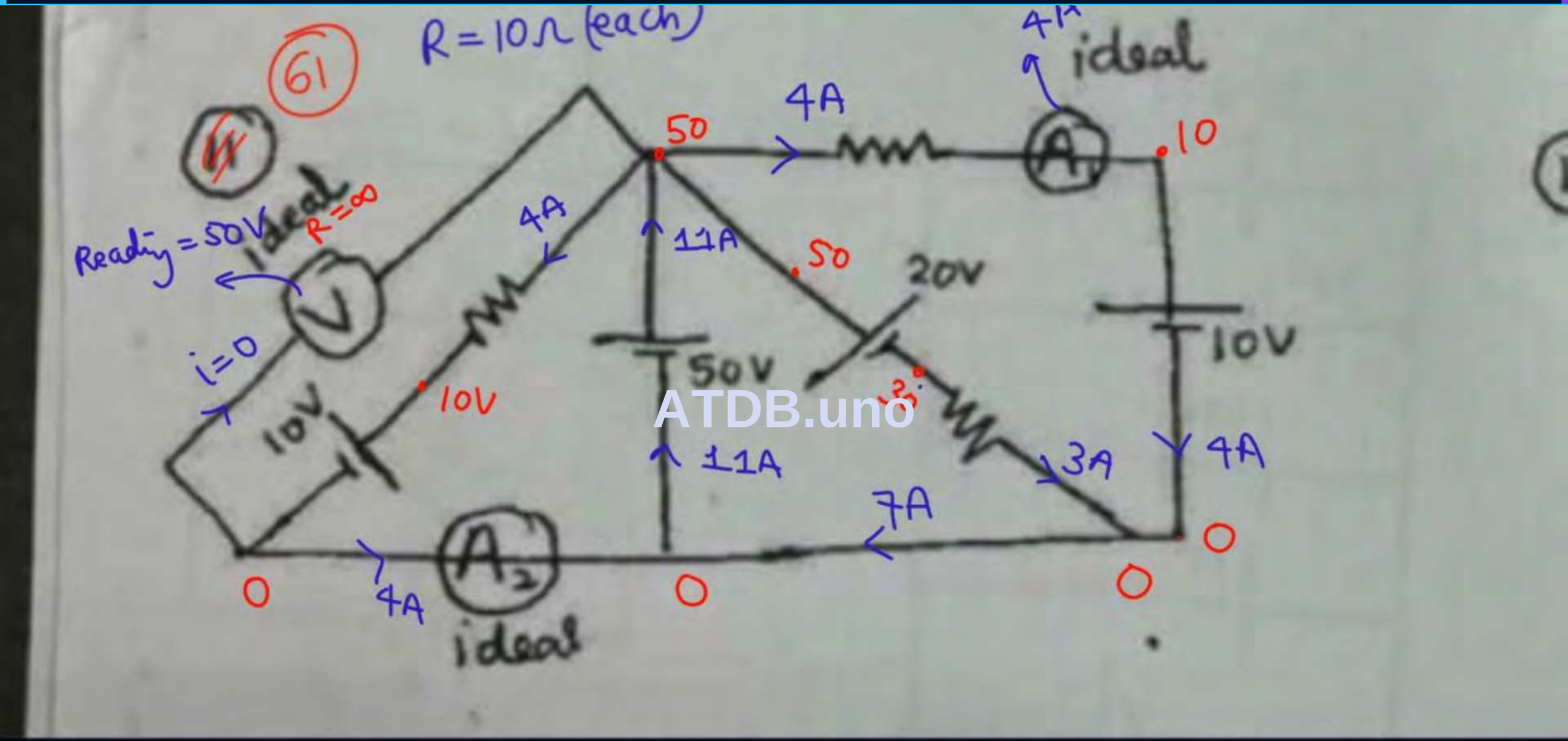


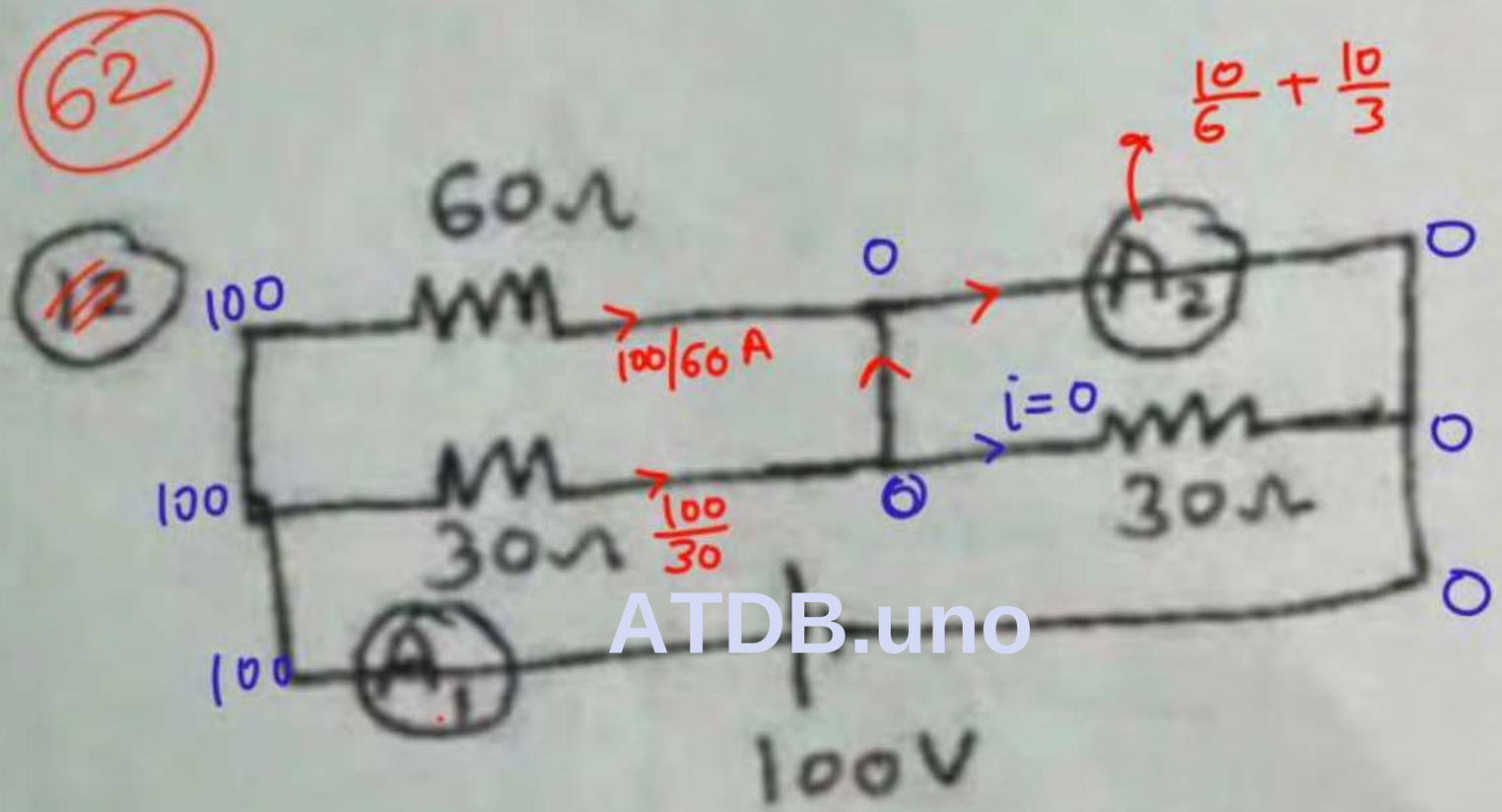




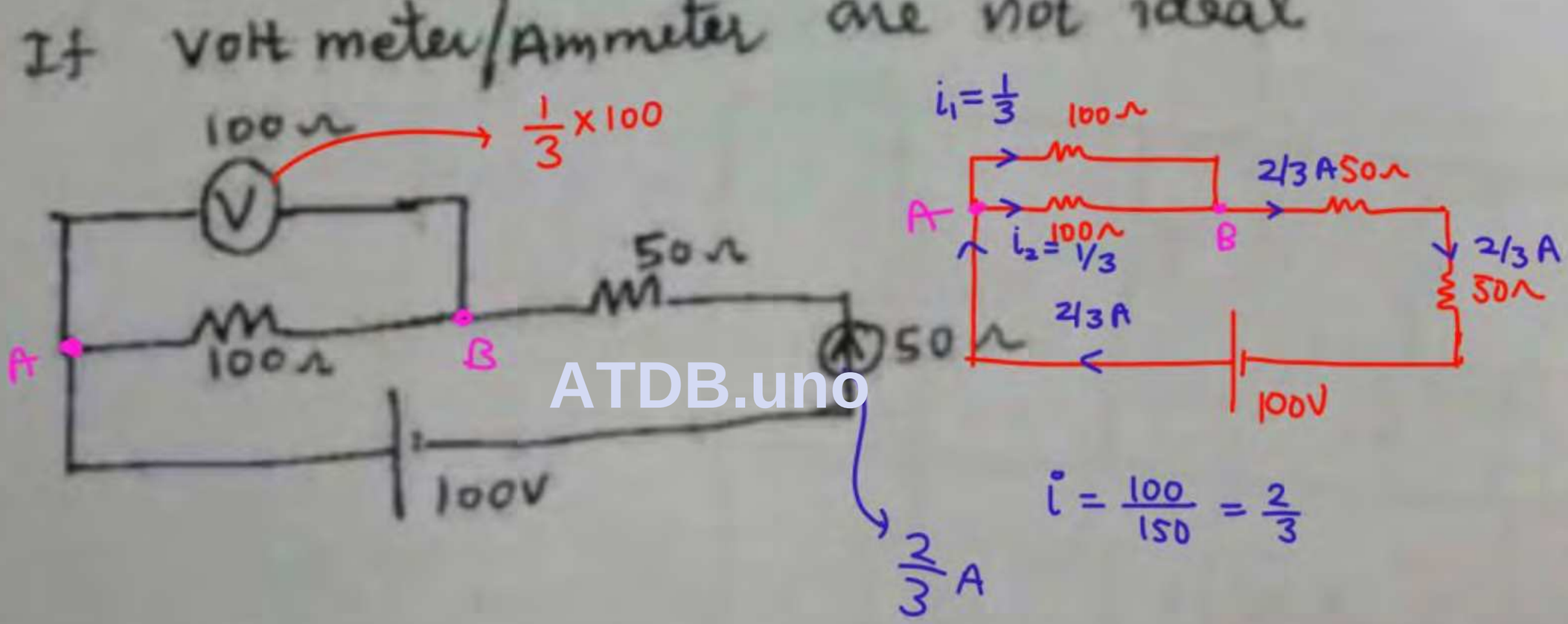
$$\frac{x-10}{10} + \frac{x-100}{10} + \frac{x+50-40}{10} + \frac{x-40}{10} = 0$$

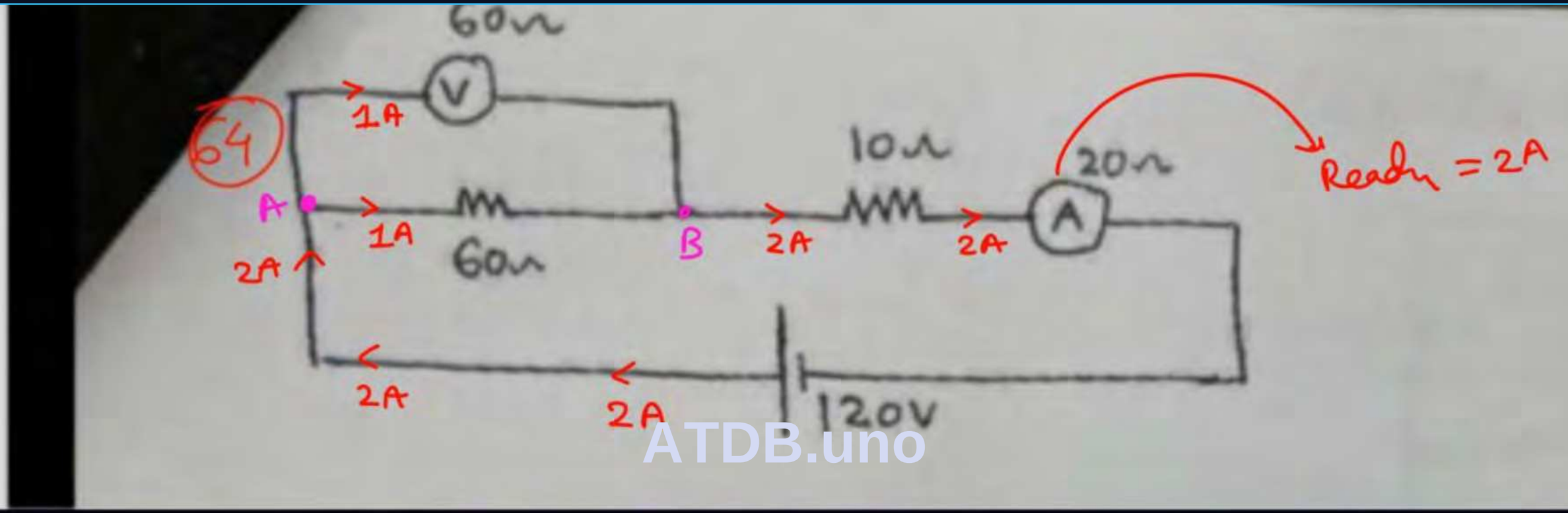
$$4x = 140$$



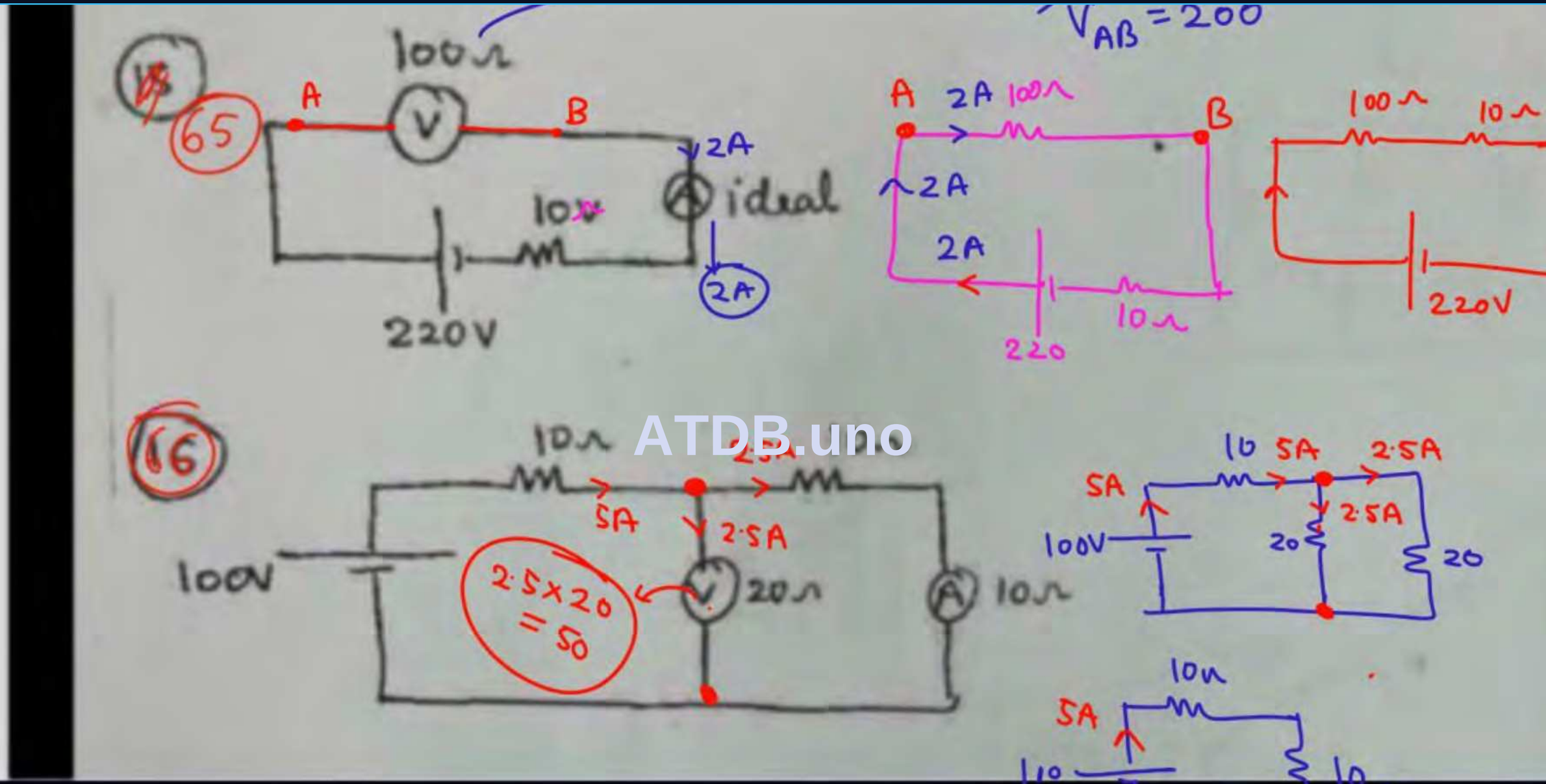


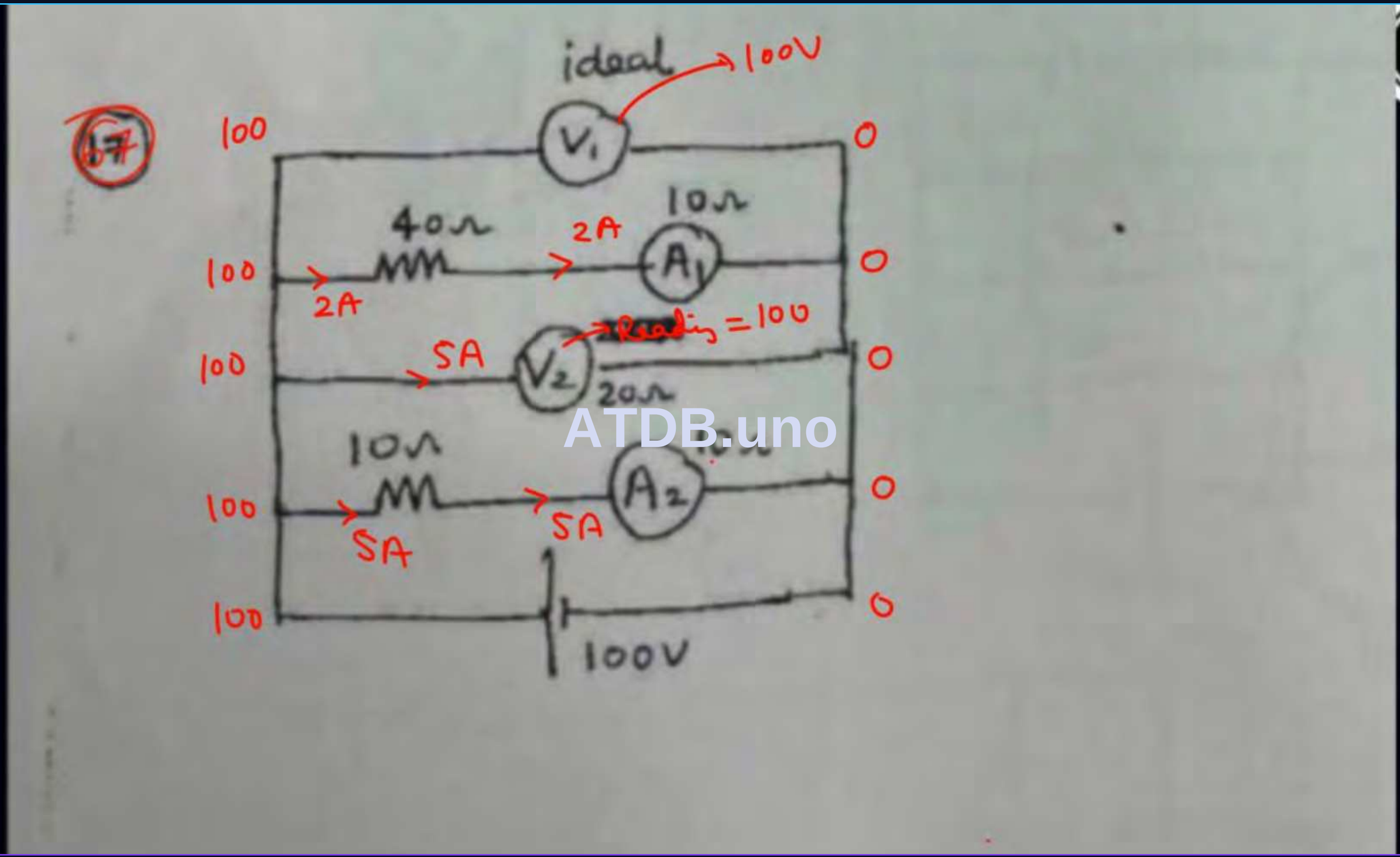
(13) If Volt meter/Ammeter are not ideal





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





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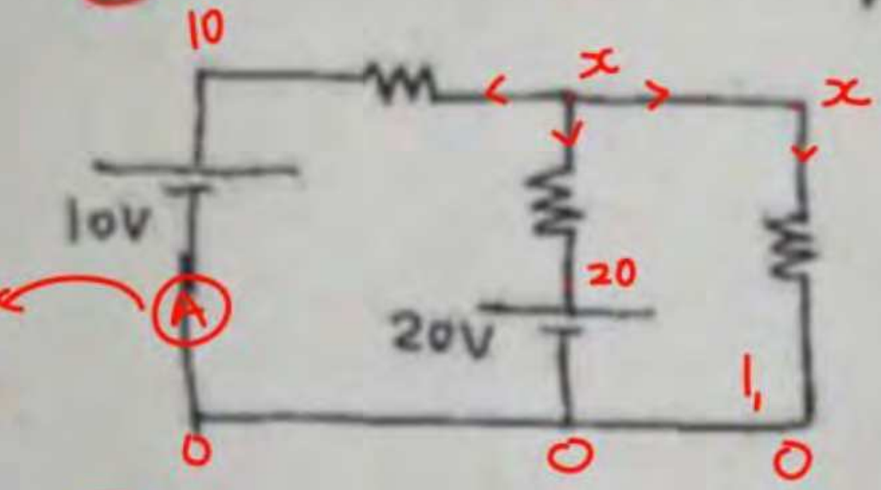
पासंनि वाले ques.



zero

$R = 10\Omega$ (each)

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

$x = 10$

69

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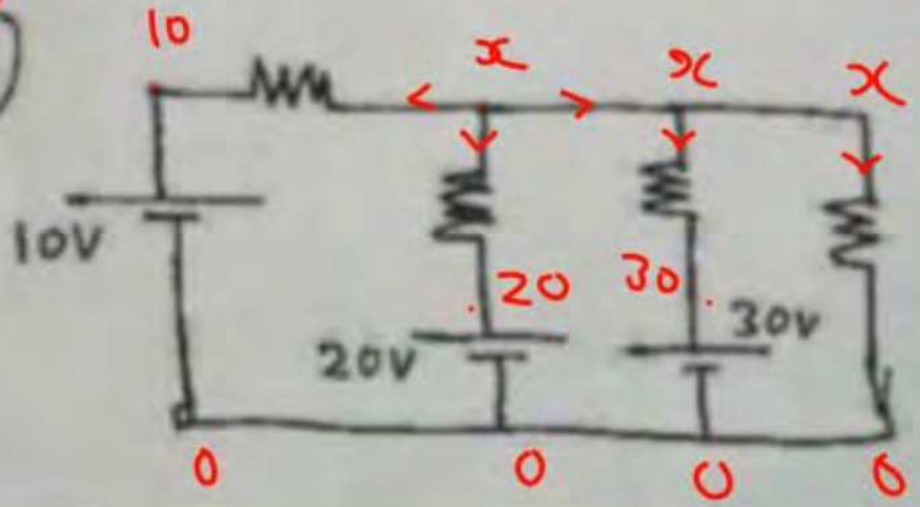
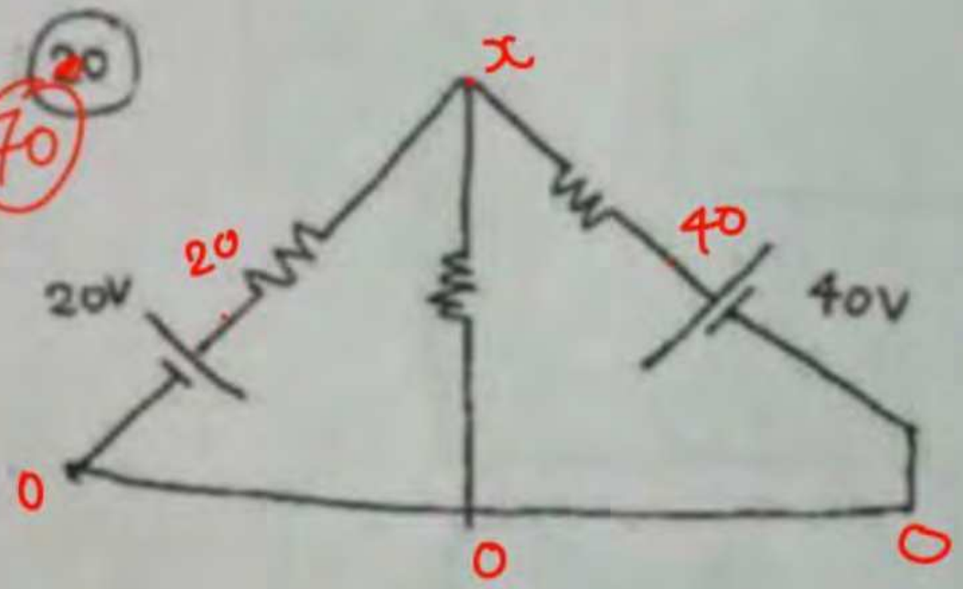


$$\frac{x-10}{10} + \frac{x-20}{10} + \frac{x-30}{10} + \frac{x-0}{10} = 0$$

$R = 10\Omega$ (each)

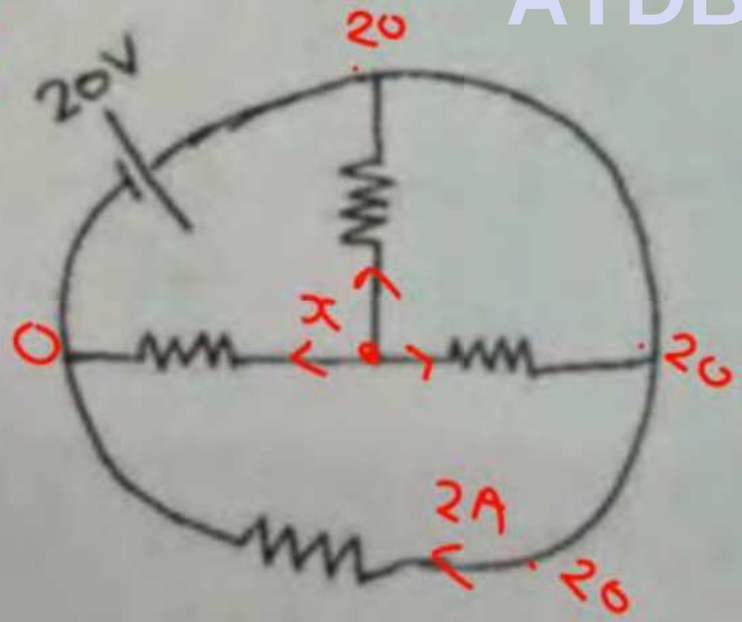
70



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

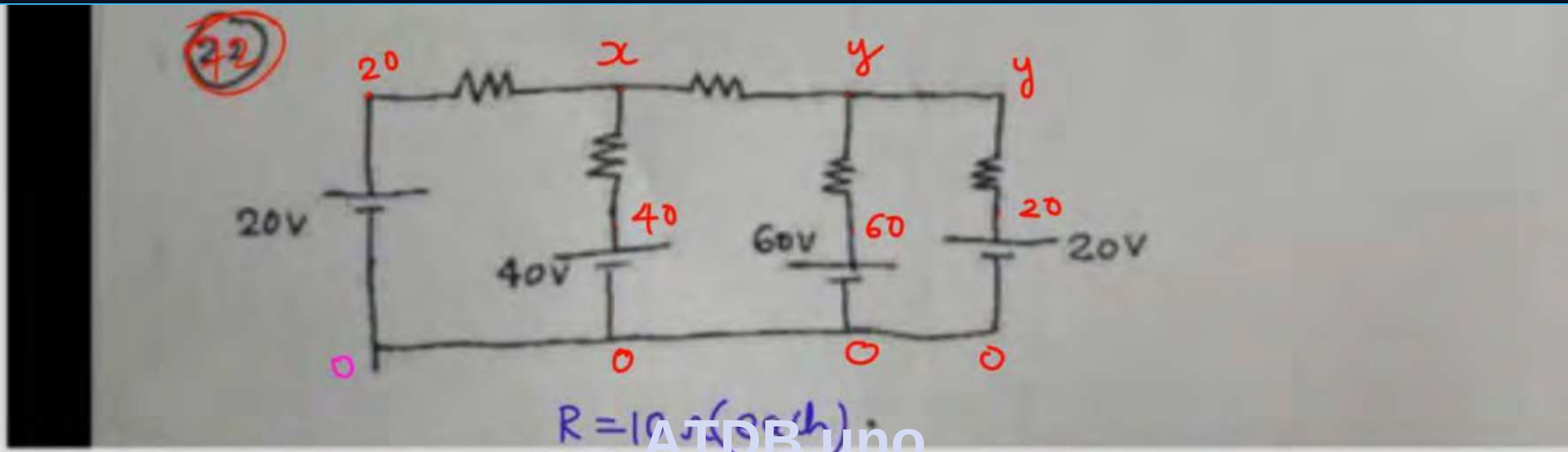
$$\frac{x-20}{10} + \frac{x-0}{10} + \frac{x-40}{10} = 0$$

71



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

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



$R = 10\ \Omega$ (approx)

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

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