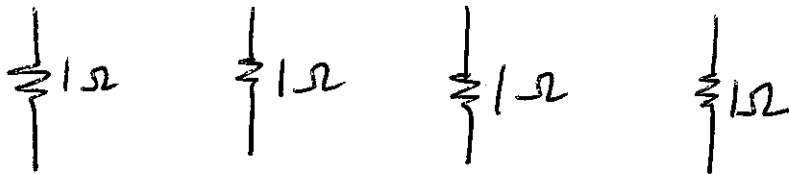


1  
J: Analyze Circuits 4:

Given 4 Four 1 Ohm Resistors



~~Explain how to combine~~

Figure out different ways to  
combine them to create:

- (A) a 4  $\Omega$  ~~resistor~~ equivalent resistance
- (B) a  $\frac{1}{4}$  Ohm ~~resistor~~ equivalent resistance
- (C) a  $1\Omega$  ~~resistor~~ (made from all 4  $1\Omega$  resistors)  
equivalent resistance

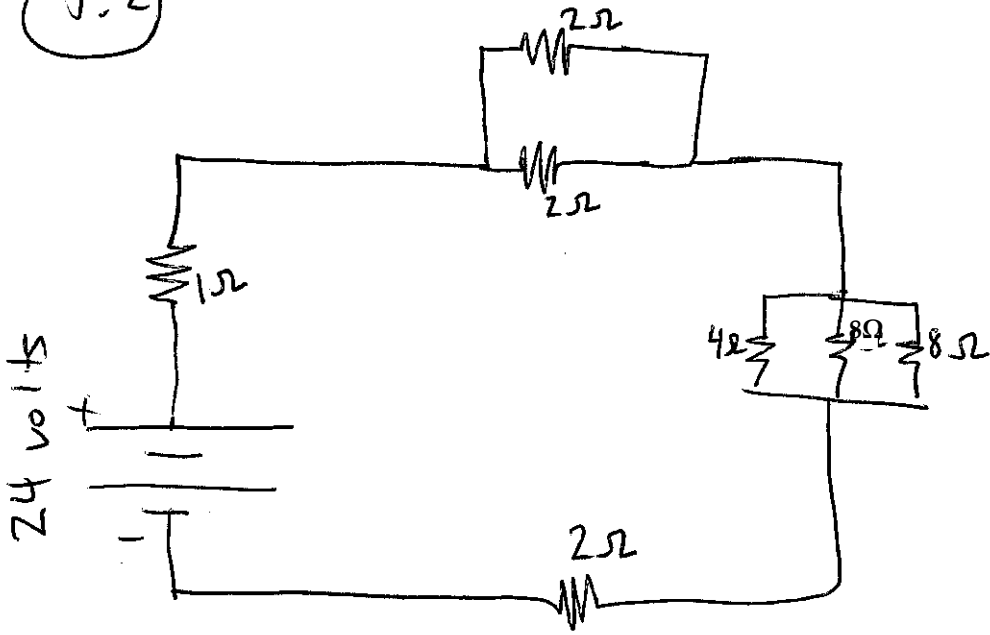
2  
a

For each of the following circuits

- (A) Determine the potential difference across each resistor, the current through each resistor, and the power emanated by each resistor.
- (B) Create a graph ~~for~~ of electric potential for your circuit. Label the current on each branch of the circuit. Label each resistor by indicating the resistance of that resistor and the power emanated by that resistor. You do not need to name each resistor individually.
- (C) Pick two junctions on your circuit. Explain in words how each junction follows the junction rule properly.
- (D) Pick two loops on your circuit. Explain in words how each loop follows the loop rule properly.
- (E) Demonstrate that ~~your~~ <sup>the</sup> circuit follows the conservation of energy by illustrating that the sum of the power emanated from each resistor is equal to the total power ~~emitted~~ ~~emit~~ <sup>drawn</sup> from the battery.

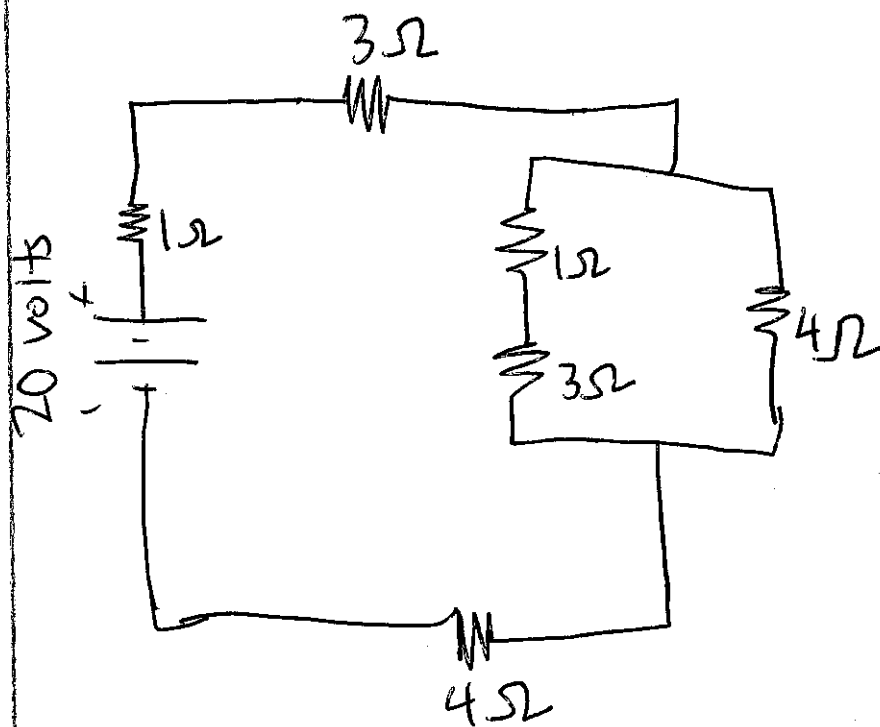
3

J.2

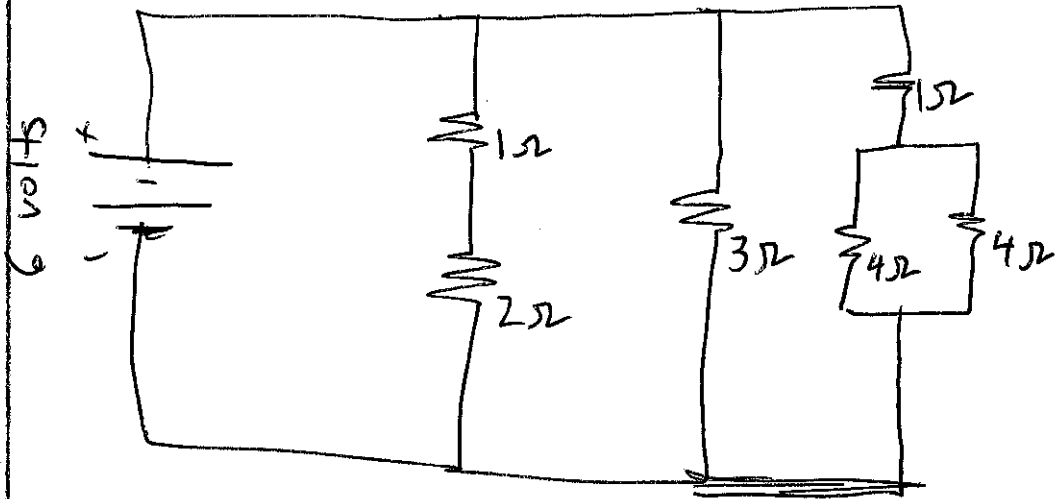


4

J.3



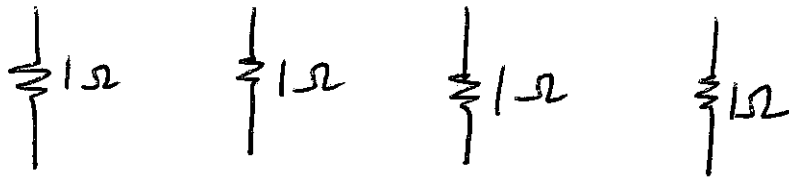
5.4



# Answers

J: Analyze Circuits 4:

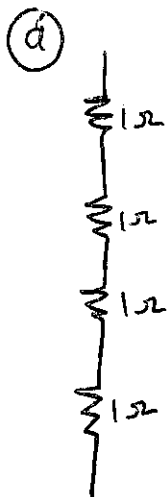
Given 4 Four 1 Ohm Resistors



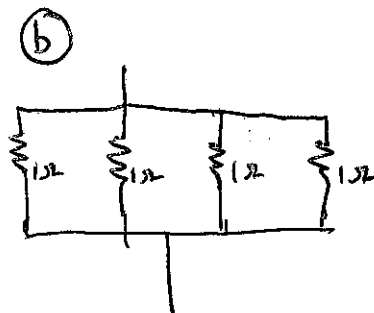
~~Explain how to create~~

Figure out different ways to combine them to create:

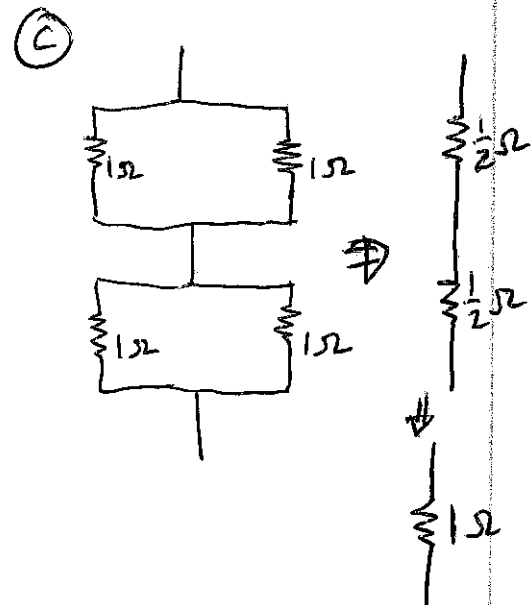
- (A) a 4 Ω ~~resistor~~ equivalent resistance
- (B) a 1/4 Ohm ~~resistor~~ equivalent resistance
- (C) a 1 Ω ~~resistor~~ (made from all 4 1 Ω resistors) equivalent resistance



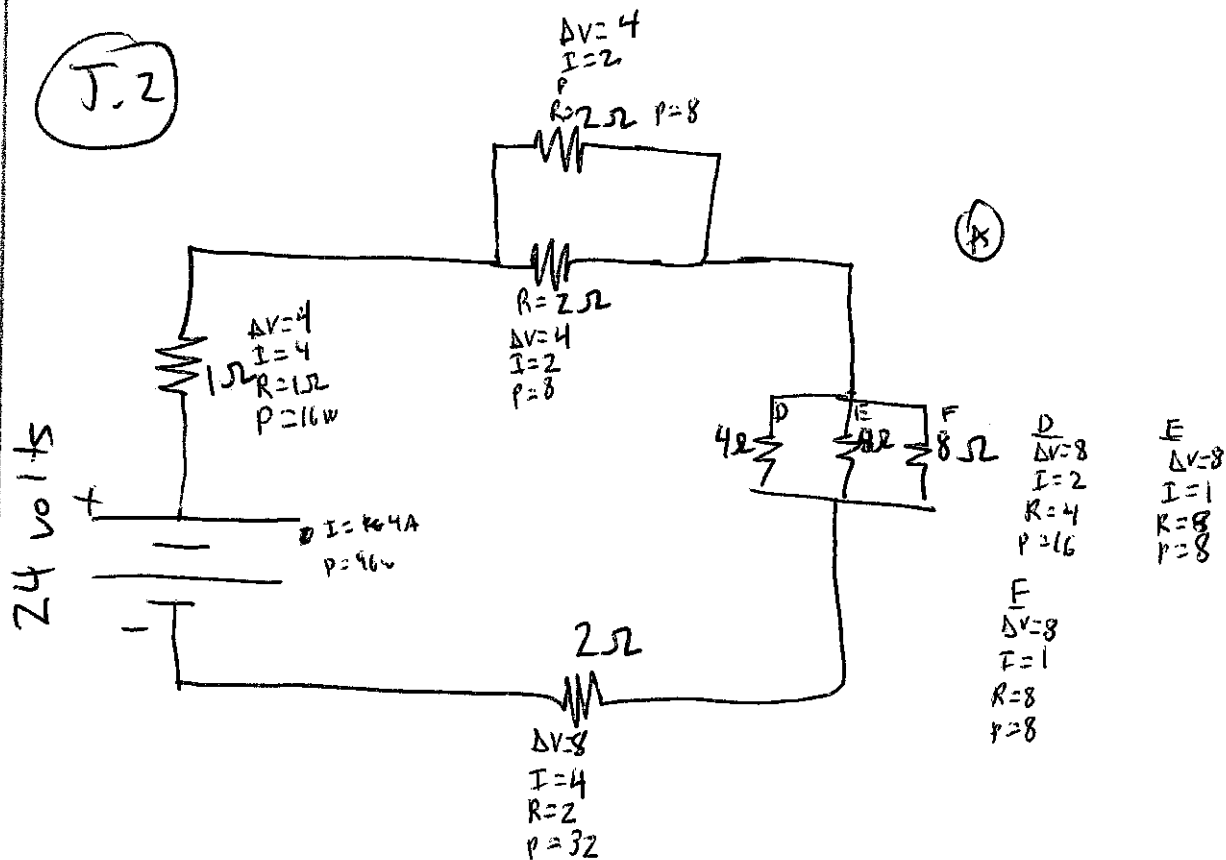
$$R_{total} = 1 + 1 + 1 + 1 = 4\Omega$$



$$\frac{1}{R_{tot}} = \frac{1}{1} + \frac{1}{1} + \frac{1}{1} + \frac{1}{1} = \frac{4}{1}$$
$$R_{total} = \frac{1}{4}$$



J.2



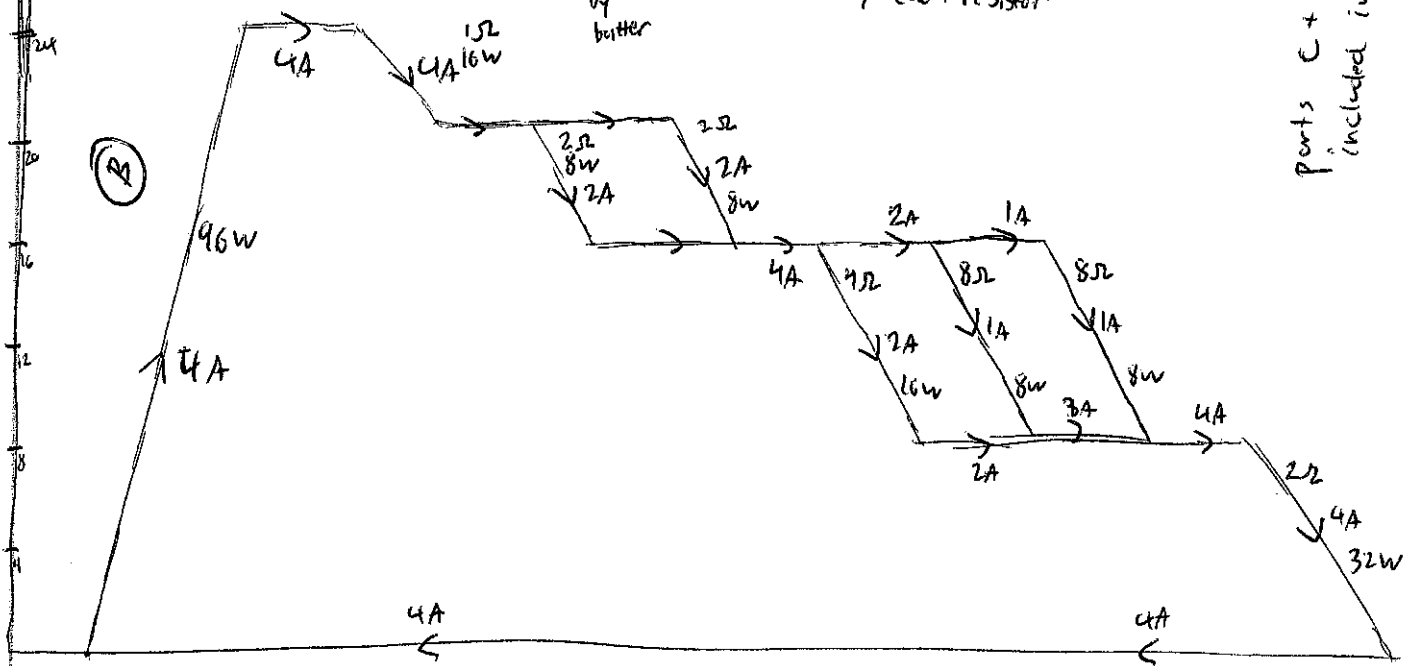
96 watts = 16 + 8 + 8 + 16 + 8 + 8 + 32

power inputted by battery

power outputted by each resistor

parts c + d over 4 included in this answer

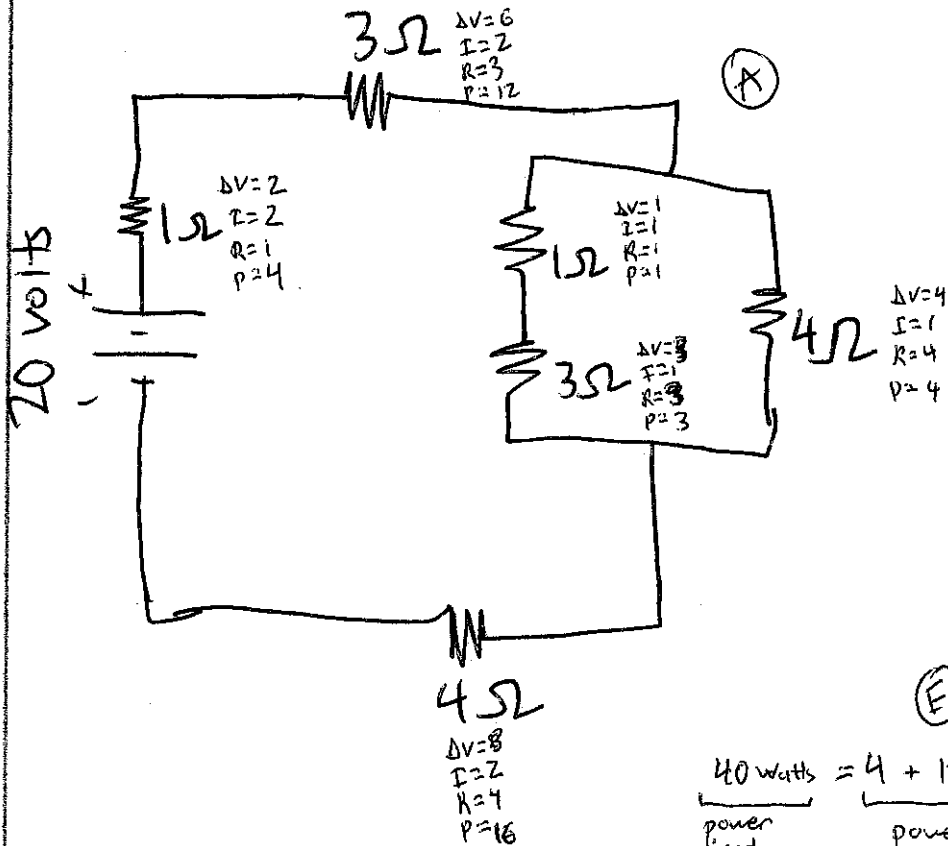
Electric Potential (V)



4

Ans-03

(J-3)



(E)

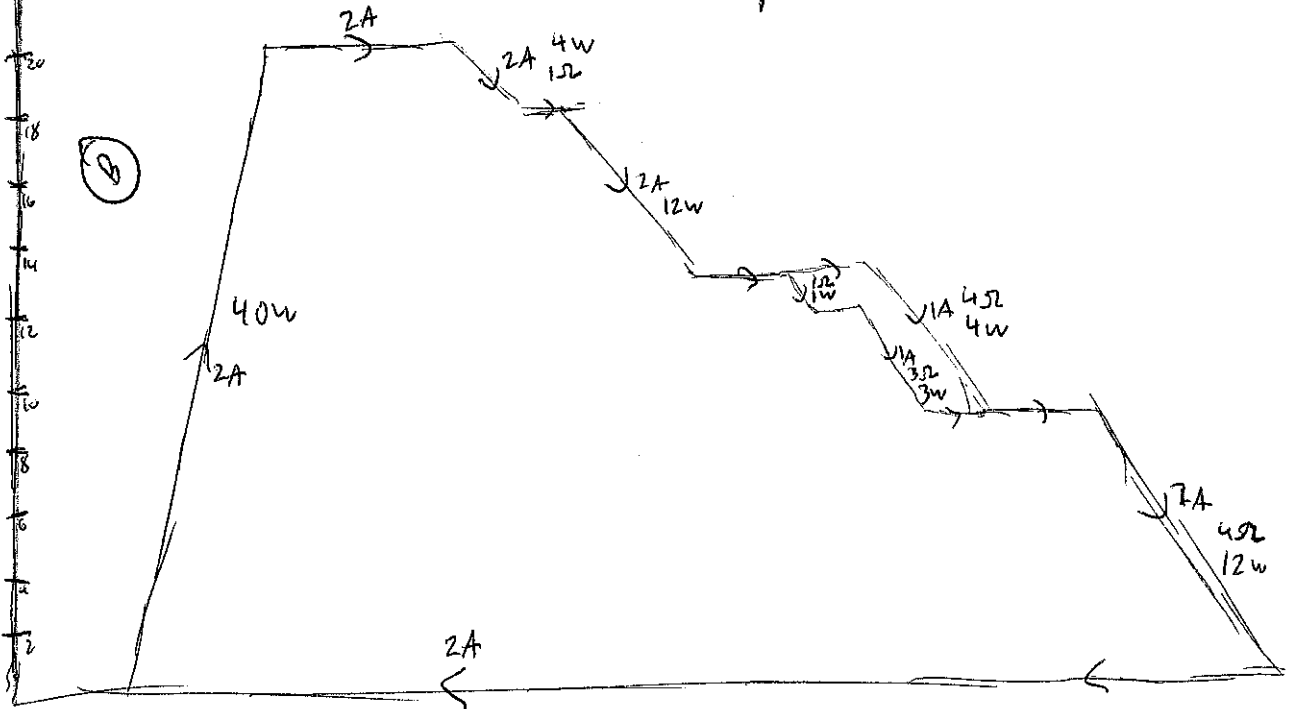
$$40 \text{ watts} = 4 + 12 + 1 + 3 + 4 + 16$$

power input by battery

power output by resistors

Electric Potential (V)

(B)



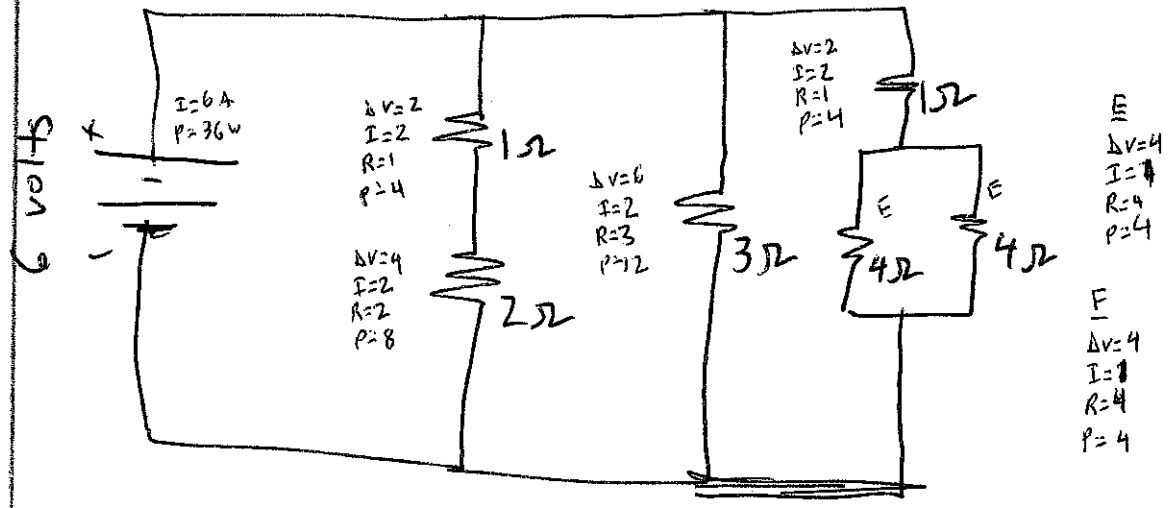


8

J.4

Answer

(A)



parts c + d  
aren't included  
in this answer

(4)

~~36W~~

$36 \text{ Watts} = 4 + 8 + 12 + 4 + 4 + 4 \checkmark$

power  
inputted  
by  
battery

power  
outputted  
by each  
resistor

Electric Potential (V)

(B)

