Unit 7 Quiz 1 Answers

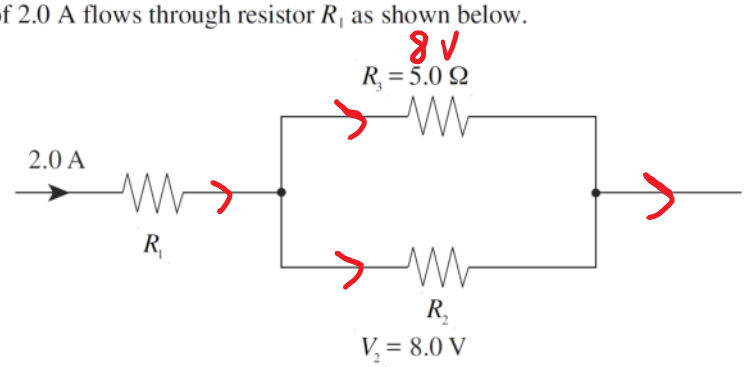
May 13, 2020 9:26 PM

Physics 12 Score:____/16 Name: Anne Surkee

Unit 7 Quiz 1 Version 1

1.

A current of 2.0 A flows through resistor R_1 as shown below.

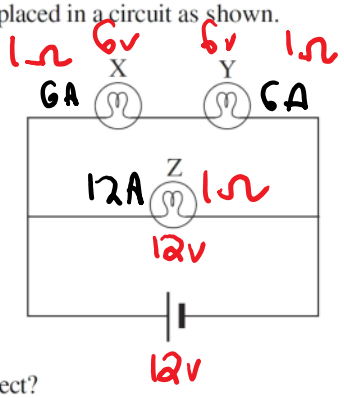


What is the current flowing through the 5.0 Ω resistor?

$I = \frac{V}{R} = \frac{8}{5}$

A. 0.40A
B. 1.0 A
C. 1.2 A
D. 1.6 A

2. Three identical light bulbs are placed in a circuit as shown.



Which of the following is correct?

A. The voltage and current are the same for all three bulbs.
B. The current in light bulb Z is less than the current in light bulb X.
C. The current in light bulb Z is greater than the current in light bulb Y.
D. The voltage across light bulb Z is less than the voltage across light bulb X.

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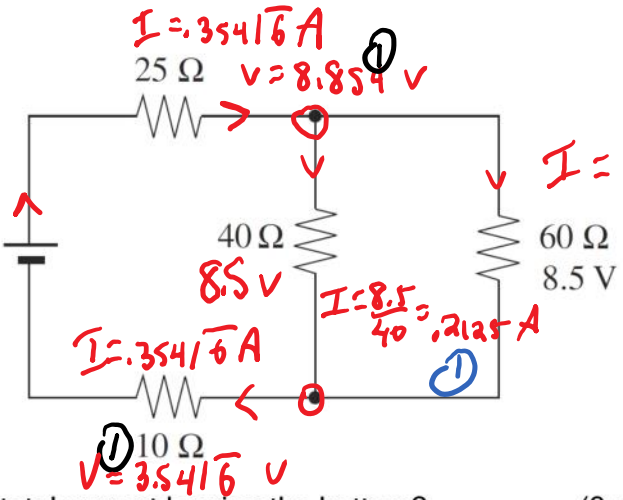
3.



a) What is the total current leaving the battery? (3 marks)

$I_T = 0.141\bar{6} + .2125 = 0.3541\bar{6}$ A

b) What is the voltage of the battery? (4 marks)

$V_{total} = 8.854 + 8.5 + 3.5416 = 20.9$ V

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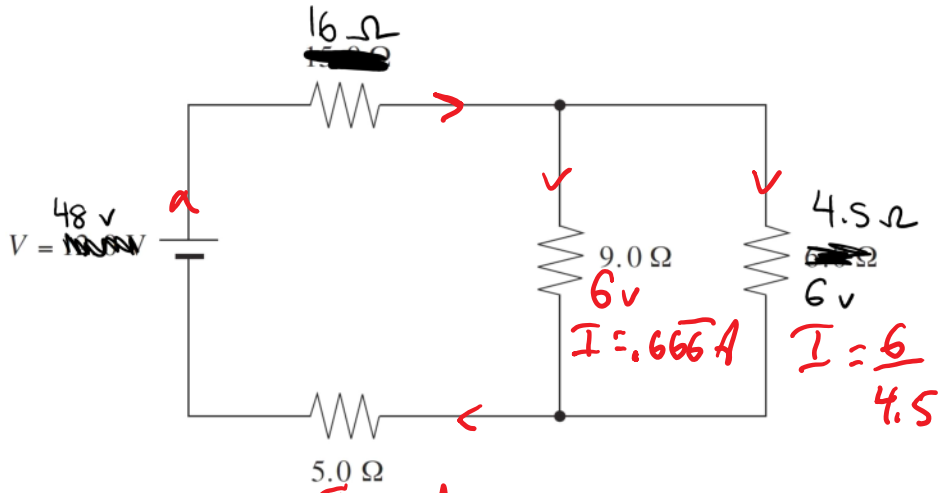
4.



a) Find the power loss through the 5 Ω resistor. (4 marks)

$I_T = .666 + 1.333 = 2.0\ A$ (1) (1) (1)

$P = I^2R = 2^2(5) = \boxed{20.\ W}$ (1)

b) Suppose the 4.5 Ω resistor is removed from the circuit. If the 5 Ω resistor is a light bulb, how does its brightness compare to its brightness in part (a)?

The bulb is: brighter **dimmer** unchanged

(circle the correct answer) (1 mark)

c) Using principles of physics, defend your answer to part (b) (2 marks)

Remove resistor in parallel: $R_T \uparrow$ (to 30 Ω)

If $R_T \uparrow$, then $I_T \downarrow$ ($I_T = \frac{V_T}{R_T} = 1.6\ A$)

Since $P = I_T^2 R$, power in the 5 Ω will be smaller, so dimmer