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Question: 1. Calculate the value of Rx in the figure below which makes t...

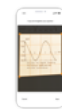
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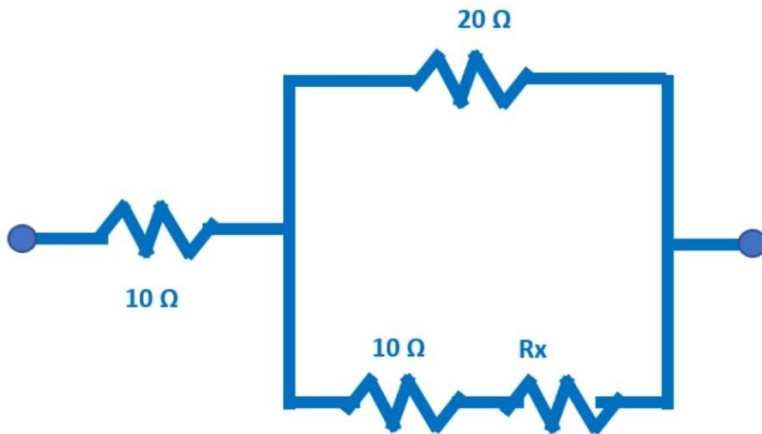


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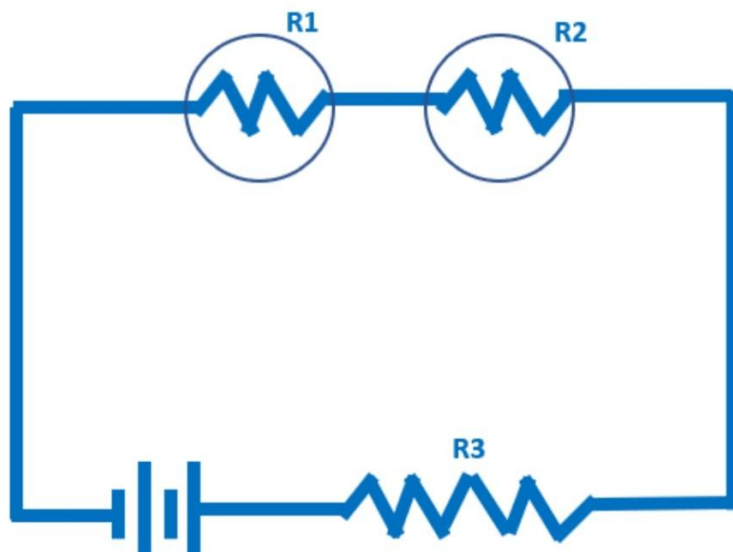
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1. Calculate the value of R_x in the figure below which makes the total resistance of the circuit also equal to R_x .



2. Two lamps need 50 V and 2.0 A each in order to operate at the desired brilliancy. They are to be connected in series across a 120 V line. What is the resistance of the rheostat which must be placed in series with the lamps?



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Expert Answer



Durgababu Gampala answered this
18,669 answers

Was this answer helpful?



$$1) R_x = 10 + \frac{20 \times (10 + R_x)}{20 + 10 + R_x}$$

$$R_x - 10 = \frac{200 + 20R_x}{30 + R_x}$$

$$(R_x - 10)(30 + R_x) = 200 + 20R_x$$

$$30R_x - 10R_x + R_x^2 - 300 = 200 + 20R_x$$

$$R_x^2 = 500$$

$$R_x = 22.36 \Omega$$

$$2) R_1 = \frac{50}{2} = 25 \Omega = R_2$$

$$R_1 + R_2 + R_3 = 25 + 25 + R_3 = 50 + R_3$$

$$V = IR$$

$$120 = 2 \times (50 + R_3)$$

$R_3 = 10 \Omega$

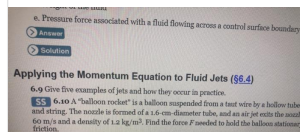
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You and your friends are doing physics experiments on a frozen pond that serves as a frictionless, horizontal surface. Sam, with mass

[See answer](#)

problem 6.9



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