

Answer on Question #49881- Physics - Electric Circuits

Question:

In the figure below, $R_1 = R_2 = 5.00$ and $R_3 = 1.50$. Find the equivalent resistance between points D and E. (Hint: Imagine that a battery is connected across those points.)

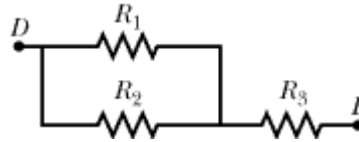


Fig.1

Solution:

The resistors R_1 and R_2 are connected in parallel (see Fig.1). So, we can replace these two resistors with equivalent resistance $R_{12} = R_1 R_2 / (R_1 + R_2)$. The resistors R_{12} and R_3 are connected in series. We also can replace these two resistors with equivalent resistance $R = R_{12} + R_3 = R_1 R_2 / (R_1 + R_2) + R_3$. In this case the equivalent resistance between points D and E $R = R_1 R_2 / (R_1 + R_2) + R_3 = 5 \cdot 5 / (5 + 5) + 1.5 = 2.5 + 1.5 = 4\Omega$

Answer: The equivalent resistance between points D and E is $R = R_1 R_2 / (R_1 + R_2) + R_3 = 4\Omega$.