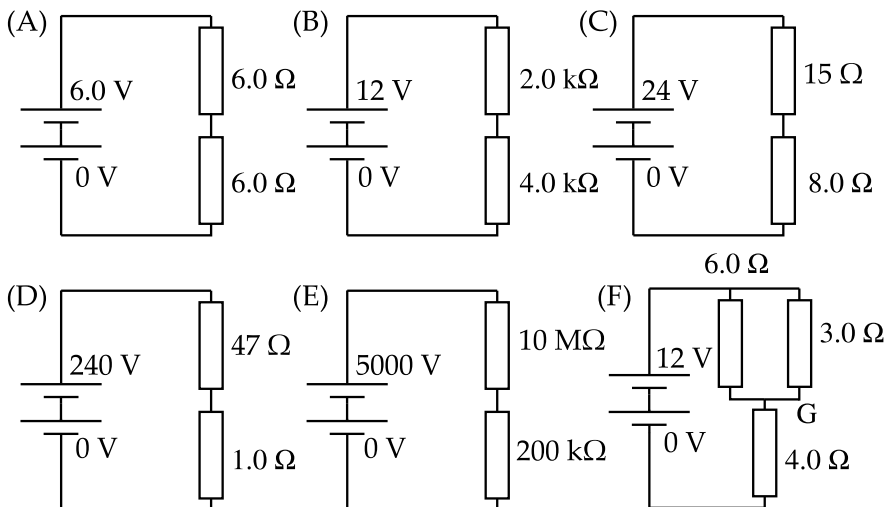


C5 Potential Dividers

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C5.1 What is the voltage across the bottom resistor in circuit (A)?

C5.2 In circuit (B):

- What is the voltage across the bottom resistor?
- What would the potential of the point between the resistors be if the $2.0\text{ k}\Omega$ resistor were removed, leaving a gap in its place?
- What would the potential of the point between the resistors be if the $4.0\text{ k}\Omega$ resistor were removed, leaving a gap in its place?
- What would the potential of the point between the resistors be if the $2.0\text{ k}\Omega$ resistor were removed and a wire was attached in its place to complete the circuit?
- A voltmeter with resistance $10\text{ k}\Omega$ is used to measure the voltage across the $4.0\text{ k}\Omega$ resistor. What would it read?

C5.3 What is the voltage across the bottom resistor in circuit (C)?

C5.4 What is the voltage across the bottom resistor in circuit (D)?

- C5.5 What is the voltage across the bottom resistor in circuit (E)?
- C5.6 What is the potential at G, the junction between the two resistors in parallel and the one in series, in circuit (F)?
- C5.7 The $8.0\ \Omega$ resistance in circuit (C) is a loudspeaker (the battery represents the amplifier). The other resistor is replaced with a variable resistor which can take all values between $0\ \Omega$ and $30\ \Omega$, and is used as a volume control. This volume control changes the voltage across the speaker. What is the range of speaker voltages which are possible? (Give the minimum and maximum.)
- C5.8 A thermistor has a resistance of $800\ \Omega$ at a temperature of $16\ ^\circ\text{C}$. It is wired in series with a fixed resistor and a $9.0\ \text{V}$ battery. A high-resistance voltmeter is connected to give a 'temperature' reading.
- If the voltage reading is to go up when the temperature increases, should the voltmeter be connected in parallel with the thermistor or the fixed resistor?
 - If the voltmeter needs to read $3.0\ \text{V}$ when the temperature is $16\ ^\circ\text{C}$, what is the resistance of the fixed resistor?