Worksheet: Ohm's Law Calculations

Name: _____

Instructions: For each problem, write the formula you are using, show your complete workings, and write your final answer with the correct units.

Section A: Basic Calculations

1. A 12V battery is connected to a resistor. If the current flowing in the circuit is 2A, what is the resistance of the resistor?
    - **Formula:**
    - **Workings:**
    - **Answer:** _____ Ω
2. A current of 3A flows through a 4Ω resistor. What is the voltage across the resistor?
    - **Formula:**
    - **Workings:**
    - **Answer:** _____ V
3. A 240V mains supply is connected to a heater with a resistance of 20Ω. How much current does the heater draw?
    - **Formula:**
    - **Workings:**
    - **Answer:** _____ A

Section B: Calculations with Prefixes

Remember: Convert all values to their base units (Volts, Amps, Ohms) before calculating.

4. A small electronic circuit is powered by a 9V battery. The total resistance of the circuit is 3 kΩ. What is the current flowing?
    - **Formula:**
    - **Workings:**
    - **Answer:** _____ A (or mA)
5. A current of 150 mA flows through a component when 30V is applied across it. What is the resistance of the component?
    - **Formula:**
    - **Workings:**
    - **Answer:** _____ Ω
6. A sensitive electronic component has a resistance of 4 MΩ. If the maximum current it can handle is 5 µA, what is the maximum voltage that can be applied across it?

- **Formula:**
- **Workings:**
- **Answer:** _____ V

Section C: Word Problems

7. You are measuring a circuit with your multimeter. The voltmeter, connected across a resistor, reads 18V. The ammeter, connected in series, reads 45mA. What is the resistance of the resistor you are measuring?
    - **Formula:**
    - **Workings:**
    - **Answer:** _____ Ω
8. An automotive headlamp has a resistance of 2.5Ω when it is on. If it is connected to a standard 12V car battery, how much current will it draw?
    - **Formula:**
    - **Workings:**
    - **Answer:** _____ A