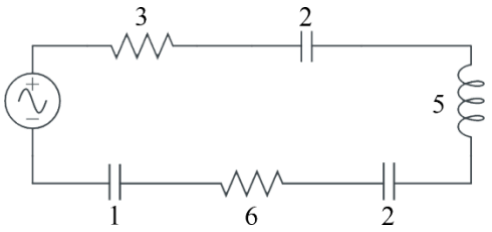
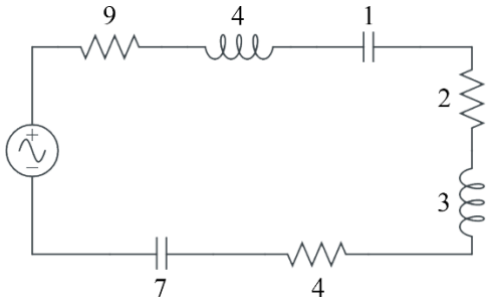
USER MANUAL—CALCULATIONS

Calculating Total Impedance

Use the circuit diagrams below to calculate the total impedance for each circuit. Write your final answer in standard form: $a+bi$.

Question 1	Question 2
	
$Total\ \ Impedance = \_\_\_\_\_$	$Total\ \ Impedance = \_\_\_\_\_$

Calculating Voltage

$Voltage = (Current)(Impedance)$ is the formula that relates voltage, current, and total impedance. Use this formula in each of the following scenarios to calculate the voltage. Write your final answer in standard form: $a+bi$.

Question 3	Question 4
What is the voltage in a circuit with current $7+5i$ and impedance $8-6i$?	What is the voltage in a circuit with current $5+8i$ and impedance $5-8i$?
$Voltage = \_\_\_\_\_$	$Voltage = \_\_\_\_\_$

Calculating Current

Use the formula $\boldsymbol{Voltage = (Current)(Impedance)}$ in each of the following scenarios to calculate the current. Write your final answer in standard form: $\boldsymbol{a+bi}$.

Question 5
What is the current in a circuit with voltage $2i$ and impedance $1+i$?
$Current =$ _____

Definition

- The **complex conjugate** of $a+bi$ is $a-bi$.
    - For example, $9+4i$ is the complex conjugate of $9-4i$.

Use the complex conjugate and the voltage formula (from above) to calculate the current. Write your final answer in standard form: $\boldsymbol{a+bi}$.

Question 6
What is the current in a circuit with voltage $2+5i$ and impedance $5+2i$?
$Current =$ _____