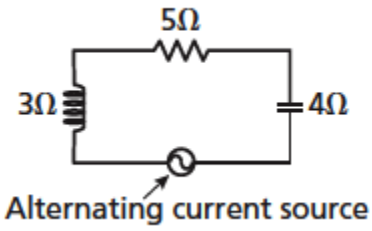
Algebra 2
128

Electrical circuit components, such as resistors, inductors, and capacitors, all oppose the flow of current. This opposition is called *resistance* for resistors and *reactance* for inductors and capacitors. Each of these quantities is measured in ohms. The symbol used for ohms is Ω, the uppercase Greek letter omega.

Component and symbol	Resistor	Inductor	Capacitor
Resistance or reactance (in ohms)	R	L	C
Impedance (in ohms)	R	Li	$-Ci$



The table shows the relationship between a component's resistance or reactance and its contribution to impedance. A series circuit is also shown with the resistance or reactance of each component labeled. The impedance for a series circuit is the sum of the impedances for the individual components. Find the impedance of the circuit.

Solution:
The resistor has a resistance of 5 ohms, so its impedance is 5 ohms. The inductor has a reactance of 3 ohms, so its impedance is 3i ohms. The capacitor has a reactance of 4 ohms, so its impedance is –4i ohms. Impedance of circuit = 5 + 3i + (–4i) = 5 – i

The impedance of the circuit is (5 – i) ohms.

Multiplication of Complex Numbers:
$4i(-6 + i)$
$= -24i + 4i^2$
$= -24i - 4$
$= \boxed{-4 - 24i}$

$(9 - 2i)(-4 + 7i)$
$= -36 + 63i + 8i - 14i^2$
$= -36 + 71i + 14$
$= \boxed{-22 + 71i}$

Solve: $2x^2 - 11 = -47$
$2x^2 = -36$
$x^2 = -18$
$x = \pm\sqrt{-18} = \pm i\sqrt{18}$
$\boxed{x = \pm 3i\sqrt{2}}$

Algebra 2 Assignment 128 Thursday October 29 2015 Hour Name

1. $(6 - i) + (7 + 3i)$

2. $(9 + 5i) + (11 + 2i)$

3. $(12 + 4i) - (3 - 7i)$

4. $(2 - 15i) - (4 + 5i)$

5. $(12 - 3i) + (7 + 3i)$

6. $(16 - 9i) - (2 - 9i)$

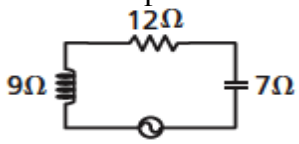
7. $7 - (3 + 4i) + 6i$

8. $16 - (2 - 3i) - i$

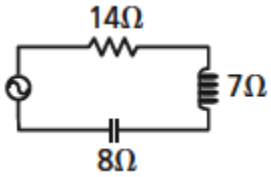
9. $-10 + (6 - 5i) - 9i$

10. $-3 + (8 + 2i) + 7i$

11. Find the impedence of the series circuit.



12. Find the impedence of the series circuit.



13. $3i(-5 + i)$

14. $2i(7 - i)$

15. $(7 + 5i)(8 - 6i)$

16. $(8 + 3i)^2$