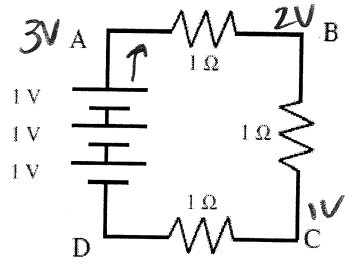
1. Fuse	B	A.	An independent path in a parallel circuit.
2. Circuit breaker	D	B.	A device that breaks to protect against excessive current. Must be replaced.
3. Wire	E	C.	Where branches joint or split.
4. Branch	A	D.	Protects against high current, but can be reset.
5. Power	F	E.	Where most of the electrons in a circuit come from.
6. Junction	C	F.	The product of voltage and current.

Which is brighter: a 60 W or a 100 W bulb?
Which one uses more power?
100W

A 4 Ω and a 10 Ω light bulb are in series. Which one is brighter?
Why? In series - same current, more voltage

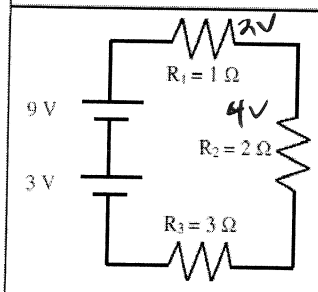
A 4 Ω and a 10 Ω light bulb are in parallel. Which is brighter?
Why? Same voltage - 4Ω more current
more power

Label the voltages at the letters.



V at A = 3V
V at B = 2V
V at C = 1V
V at D = 0V

The electricity in your house is 120 volts. How many amps does a 60 watt light bulb use?
P 60W P = V · I
I ?
V 120V I = P/V 60W/120V = 0.5A
How much power is used by a 120 V circuit using 6 amps?
P
I 6A P = V · I
V 120V = 120V · 6A = 720W
A 240 volt circuit (like your dryer) has 20 amps flowing through it. How much power is it using?
P
V 240V P = VI
I 20A 240V · 20A = 4800W or 4.8kW



Series or parallel?

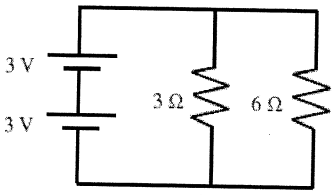
Which resistor uses the most power? R3

Why? Uses most Voltage

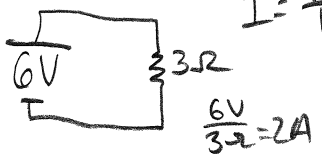
V_T = 12V
R_T = 6Ω
I_T = 12V/6Ω = 2A
V over R_1 = V=IR 2A · 1Ω = 2V
V over R_2 = 2A · 2Ω = 4V
V over R_3 = 2A · 3Ω = 6V
$P_{2\Omega}$ = P = V · I 4V · 2A = 8Watts
$P_{3\Omega}$ = 6V · 2A = 12Watts
P_T = 12V · 2A = 24Watts

35 amps of current goes through a 40 amp fuse. What happens?
Nothing
25 amps of current goes through a 15 amp fuse. What happens?
Fuse melts

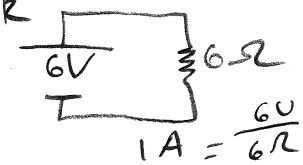
Split the following parallel circuit into two independent series circuits.



I = V/R



6V/3Ω = 2A

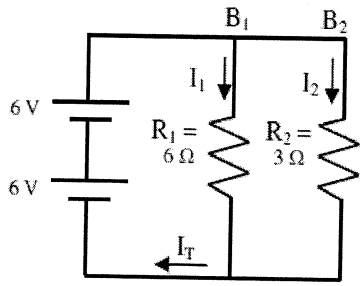


1A = 6V/6Ω

Find the current in each circuit.

Find the total current. 3A

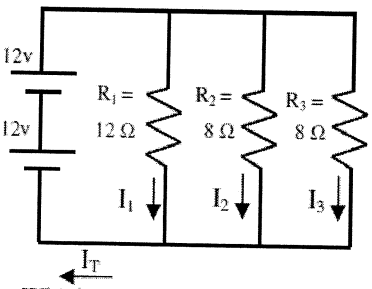
Find the total resistance.
$R_T = V_T / I_T$ 6V/3A R_T = 2Ω



Series or parallel?

Which resistor will use more power? R2

V_T = 12V
$V_{Branches}$ = 12V
I_1 = V/R 12V/6Ω = 2A
I_2 = 12V/3Ω = 4A
I_T = 6A
R_T = V/I 12V/6A = 2Ω
$P_{6\Omega}$ = V · I = 12V · 2A = 24W
$P_{3\Omega}$ = 12V · 4A = 48W
P_T = 12V · 6A = 72W



Which resistor uses the most power?

V_T = 24V
$V_{Branches}$ = 24V
I_1 = 24V/12Ω = 2A
I_2 = 24V/8Ω = 3A
I_3 = 24V/8Ω = 3A
I_T = 8A
R_T = V/I 24V/8A = 3Ω
P_T = 24V · 8A = 192W