Basic Resistor Calculations
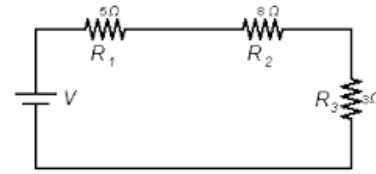
Calculate the Total Resistance of resistors in series…

Simply add the values of the resistors

Total Resistance = R1 + R2 + R3

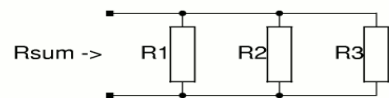If each resistor is 10 ohms, total resistance is 30 ohms

Resistors in series

Calculate Total Resistance of Resistors in Parallel…

Invert the value of each resistor, and them together and invert the result. If each resistor is 10 ohms…

Add the inverted values .1 +.1 +.1=.3 (.where 1 = 1/10)

Invert the .3 to get the total resistance of 3.33 ohms...

Parallel resistors

$$\frac{1}{Rsum} = \frac{1}{R1} + \frac{1}{R2} + \frac{1}{R3}$$

When you have combinations of series and parallel resistors, simplify the circuit by calculating the resistance of each series or parallel group independently. Do the paralleled resistor groups first…
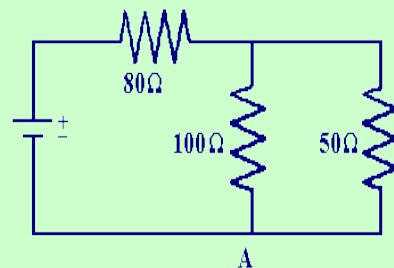
The 100 ohm and 50 ohm resistors are in parallel.
  100 inverted (.01) + 50 inverted (.02) = .01
  Invert .03 to get the total resistance of the two = 33.3 ohms.

The two parallel resistors are the same as a single 33.3.ohm

The series circuit remains with the 80 ohm resistor and the 33.3 ohm calculated. Simply add them to get 113.3 ohms total.

Resistor Color Code Chart
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If resistor only has 4 bands omit the third digit.

The standard resistor color code table:

Color	Digit 1	Digit 2	Digit 3*	Multiplier	Tolerance	Temp. Coef.	Fail Rate
Black	0	0	0	$\times 10^0$			
Brown	1	1	1	$\times 10^1$	±1% (F)	100 ppm/K	1%
Red	2	2	2	$\times 10^2$	±2% (G)	50 ppm/K	0.1%
Orange	3	3	3	$\times 10^3$		15 ppm/K	0.01%
Yellow	4	4	4	$\times 10^4$		25 ppm/K	0.001%
Green	5	5	5	$\times 10^5$	±0.5% (D)		
Blue	6	6	6	$\times 10^6$	±0.25% (C)		
Violet	7	7	7	$\times 10^7$	±0.1% (B)		
Gray	8	8	8	$\times 10^8$	±0.05% (A)		
White	9	9	9	$\times 10^9$			
Gold				$\times 0.1$	±5% (J)		
Silver				$\times 0.01$	±10% (K)		
None					±20% (M)		

* 3rd digit - only for 5-band resistors