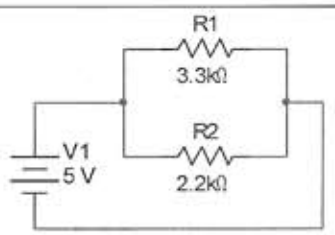
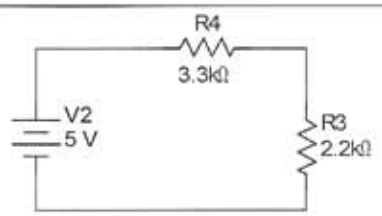
Ohms Law and combinations of resistors



$\frac{1}{R_{eq}} = \frac{1}{R_1} + \frac{1}{R_2}$

Series or Parallel? Parallel	**Series or Parallel?** series
Equivalent Resistance: $R = 1.32\,K\Omega$	**Equivalent Resistance:** $5.5K\Omega$
Current: $V/R = 5/1.32 = 3.79mA$	**Current:** $I = V/R = 5/5.5 = .91mA$

$V = IR$



If an electron and a positron annihilate each other, then how much energy would be given off?

$E = mc^2$

$E = (2m_e)c^2$

$= (2 \times 9.11 \times 10^{-31})(3 \times 10^8)^2 = 1.64 \times 10^{-13} J$

↑ electron + positron have same mass

A rotating fan completes 1200 revolutions every minute. Consider the tip of a blade, at a radius of 15cm. Through what distance does the tip move in one revolution? What is the tip's speed? What is the tip's acceleration?

distance = Circumference $= 2\pi r = 2\pi(.15) = .942\,m$

$1200\frac{rev}{min} \times \frac{min}{60s} = 20\frac{rev}{s}$ $\quad \frac{1s}{20rev}$ $\quad \frac{1}{20}s$ per rev $= .05$

$V = \frac{distance}{time} = \frac{.942}{.05} = 18.84\frac{m}{s}$ $\quad a = \frac{V^2}{r} = \frac{(18.84)^2}{(.15)} = 2366\frac{m}{s^2}$

The Leaning Tower of Pisa is 55.863 meters high. Use the concept that the gravitational potential energy is converted into kinetic energy to find the velocity of an object just before it hits the ground – assuming the object was dropped (not thrown) and that air resistance can be neglected.

gravitational energy converted to kinetic energy

$mgh = \frac{1}{2}mv^2$

masses drop $\quad gh = \frac{1}{2}v^2$

$v = \sqrt{2gh} = \sqrt{2(9.8)(55.863)} = 33.1\,m/s$