PHYS 351 Independent Study – Circuit Analysis Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  
  
Topic: Kirchhoff's Rules

1. Go to the following link and select Multi-Loop Circuit in Chap 27, and go through the simulation.  
 <http://bcs.wiley.com/he-bcs/Books?action=mininav&bcsId=5586&itemId=0470469080&assetId=211452&resourceId=20409&newwindow=true>

2. In Fig. [27-54](http://edugen.wiley.com/edugen/courses/crs4957/halliday9118/halliday9088c27/halliday9118/halliday9088c27/halliday9088c27xlinks.xform?id=halliday9088c27-fig-0054), the resistances are *R*1 = 1.0 *Ω* and *R*2 = 2.0 *Ω*, and the ideal batteries have emfs http://edugen.wiley.com/edugen/courses/crs4957/common/art/glyphs/isomscr/U02130.gif1 = 2.0 V and http://edugen.wiley.com/edugen/courses/crs4957/common/art/glyphs/isomscr/U02130.gif2 = http://edugen.wiley.com/edugen/courses/crs4957/common/art/glyphs/isomscr/U02130.gif3 = 4.0 V. What are the (a) size and (b) direction (up or down) of the current in battery 1, the (c) size and (d) direction of the current in battery 2, and the (e) size and (f) direction of the current in battery 3? (g) What is the potential difference *Va - Vb*?

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| http://edugen.wiley.com/edugen/courses/crs4957/common/art/pixel.gif | |  | | --- | | http://edugen.wiley.com/edugen/courses/crs4957/common/art/pixel.gif | | |  |  |  | | --- | --- | --- | | |  | | --- | | http://edugen.wiley.com/edugen/courses/crs4957/common/art/pixel.gif | | http://edugen.wiley.com/edugen/courses/crs4957/halliday9118/halliday9088c27/image_n/nt0067-y.gif | | | |

3. In Fig. [27-72](http://edugen.wiley.com/edugen/courses/crs4957/halliday9118/halliday9088c27/halliday9118/halliday9088c27/halliday9088c27xlinks.xform?id=halliday9088c27-fig-0072), the ideal batteries have emfs http://edugen.wiley.com/edugen/courses/crs4957/common/art/glyphs/isomscr/U02130.gif1 = 20.0 V, http://edugen.wiley.com/edugen/courses/crs4957/common/art/glyphs/isomscr/U02130.gif2 = 10.0 V, and http://edugen.wiley.com/edugen/courses/crs4957/common/art/glyphs/isomscr/U02130.gif3 = 5.00 V, and the resistances are each 2.00 *Ω*. What are the (a) size and (b) direction (left or right) of current *i*1? (c) Does battery 1 supply or absorb energy, and (d) what is its power? (e) Does battery 2 supply or absorb energy, and (f) what is its power? (g) Does battery 3 supply or absorb energy, and (h) what is its power?

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