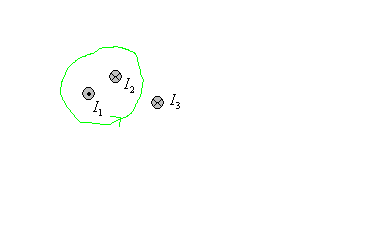
Ampere’s Law

**Problem**

Suppose I1 = 2A (out of the page), I2 = 1A (into the page) and I3 = 4A (into the page). What does the line initegral  performed around the indicated path result in?



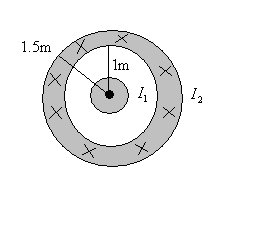
**Solution**

From Ampere’s law,



**Problem**

A typical coaxial cable has a construction of above. The inner wire sends current in one direction and the outer cylinder sends current back. Let’s assume we have an absurdly large coaxial cable with the above dimensions. Suppose that in the diagram above, I1 = 2A and I2 = 4A. Then what is B at a distance of 0.5m?



**Solution**

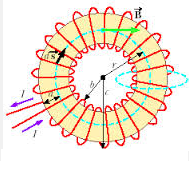
Well, it would be,



At a radius of 2m what is B? B would be,



**4**. Derive the magnetic field strength inside a toroid of radius R, with current I running through n turns per unit length.



Using that loop and Ampere’s law, we have:



**Question 9**. Suppose a wire has radius R, and is carrying current I, creating a magnetic field B = 4mT. What is the field strength inside the wire at radius r = R/3?

