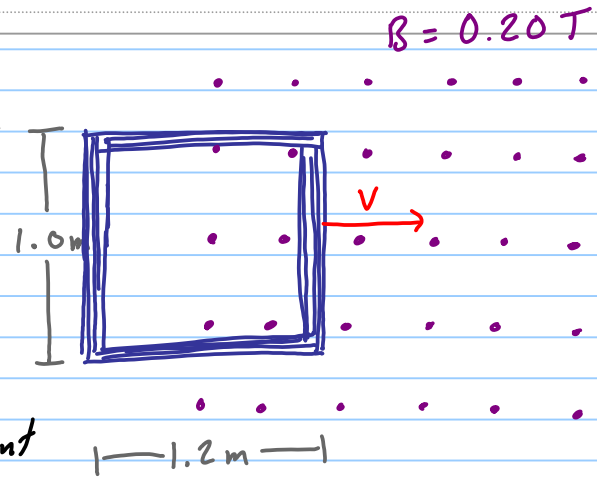
Quiz 5c

Note Title 31/05/2011

A coil of 20 loops of wire are entering a magnetic field as shown. The coil moves at 4.0 m/s.



a.) How much EMF is generated?

b.) What direction does the current flow?

c.) Although the coil moves at a constant speed, explain why the EMF eventually drops to zero. (2 points)

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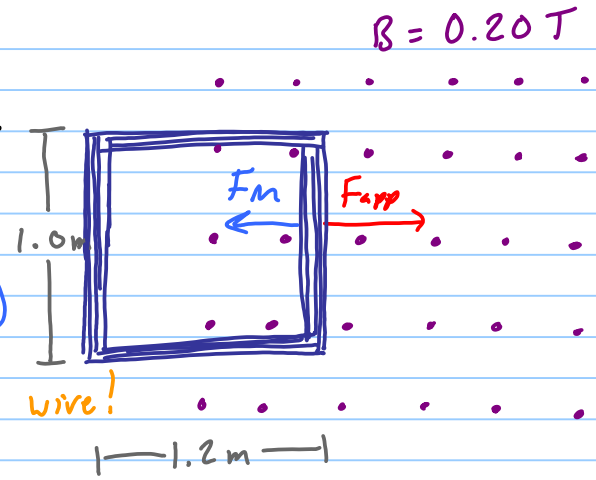

a.) How much EMF is generated?

$\mathcal{E} = Blv = (0.20T)(1.0m)(4.0m/s)$
$= 0.80V$ ✓

But wait!!! That happens in each wire!

so $\mathcal{E} = 20(0.80V) = 16V$ ✓

b.) What direction does the current flow?

RHR says clockwise ✓

c.) Although the coil moves at a constant speed, explain why the EMF eventually drops to zero. (2 points)

- Eventually the entire coil is in the field, when it is there is no change in flux ✓
- No change in flux means no EMF ✓

$$\mathcal{E} = -\frac{N\Delta\Phi}{t}$$ ← zero

↑ zero too!