A magnetic field $B = 40$ Tesla is going down through this paper. The field is turned off gradually over a time of 0.2 seconds. The rectangle below is 10cm by 5 cm.

(a) What is the induced EMF around the perimeter of the rectangle ?
(b) If there was a wire around the perimeter of the rectangle what would be the direction of the current induced in the wire? Indicate the direction on the rectangle above.

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Solution: $|\mathcal{E}| = \frac{|\Delta\Phi_B|}{\Delta t} = \frac{|\Delta B|A}{\Delta t} = \frac{(40\text{T})(0.10\text{m})(0.05\text{m})}{(0.2\text{s})} = 1.0\text{V}$.

The field is decreasing in magnitude so in order for the induced current to keep the flux form changing it will need to produce a current that is in the same direction as the existing field. Thus the induced current will produce a field into the paper. Now using the right hand rule for the B-field produced by a current we see that in order for our fingers to be going into the loop (like the field) that the our thumb must be oriented pointing clockwise around the loop. Direction is clockwise.