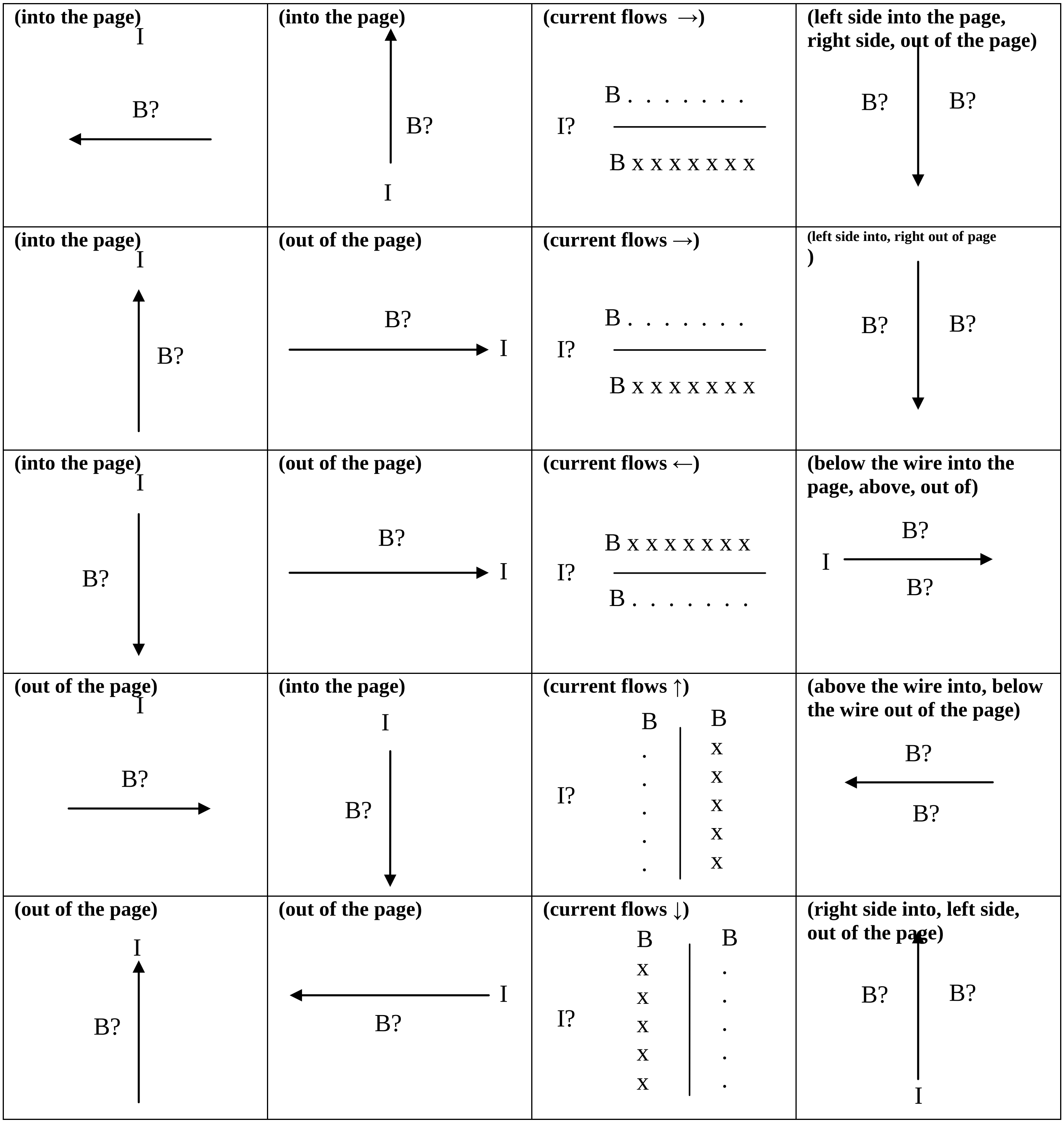
Practice for 20.1 - Right Hand Rules

1. These are vector cross product questions. The "X" in the middle means cross product. Your right hand **index finger** goes in the direction of the **first vector**, your **middle finger** in the direction of the **second vector**, and your **thumb** is the **resultant vector** or answer. (Whilst you are making the Physics gang sign)

"x" = into the page
"." = out of the page

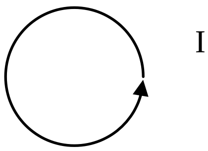
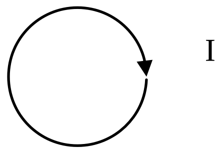
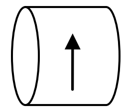
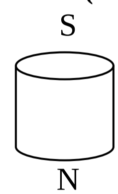
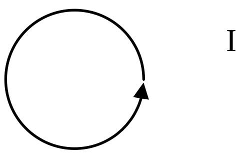
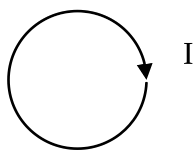
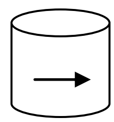
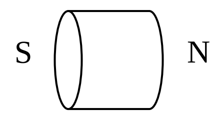
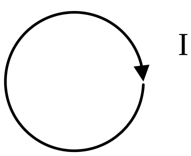
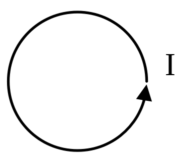
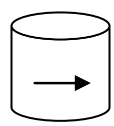
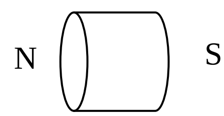
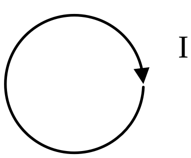
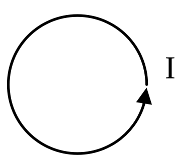
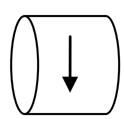
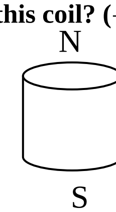
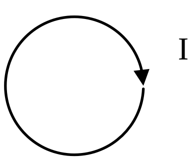
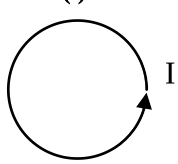
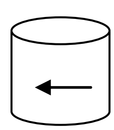
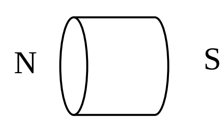
(down the page) x X →	**(up the page)** • X →	**(out of the page)** ↓ X →	**(left)** • X ↑
(right) ↓ X x	**(down the page)** → X •	**(up the page)** x X ←	**(up the page)** • X →
(into the page) → X ↓	**(right)** x X ↑	**(into the page)** ← X ↑	**(up the page)** • X →
(out of the page) ← X ↓	**(down the page)** • X ←	**(left)** ↓ X •	**(into the page)** ← X ↑
(out of the page) ↓ X →	**(left)** • X ↑	**(left)** ↓ X •	**(into the page)** ← X ↑

2. These are for the magnetic field around a wire. You wrap the fingers of your right hand around the wire with your **thumb** in the direction of the **current**. Your **fingers** wrap in the direction that the **magnetic field (B)** encircles the wire. So in these, where it says "B?" I want to know the direction of the B field there on that side of the wire. (into (x) or out of (.) the page) Where I give you the B field, I want to know which way the current would go to effect those fields.

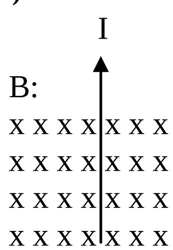
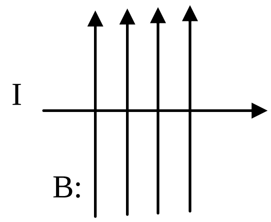
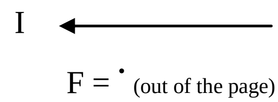
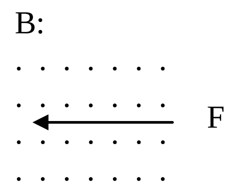
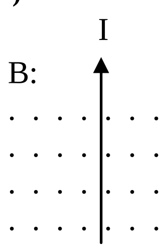
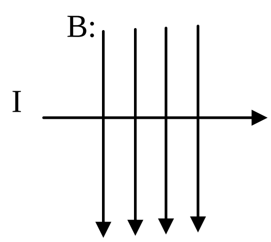
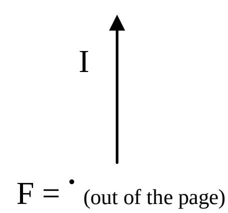
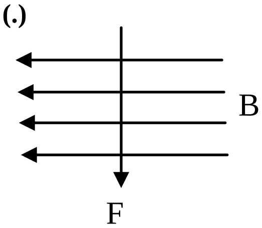
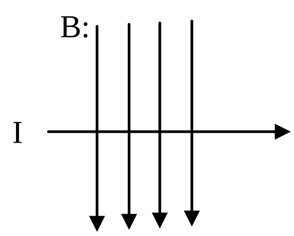
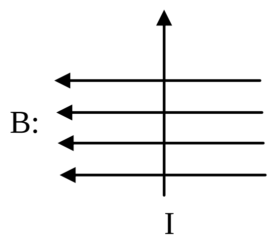
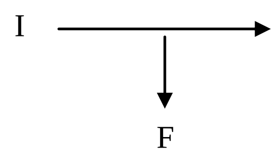
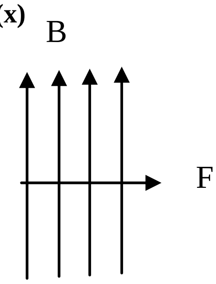
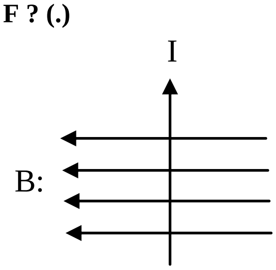
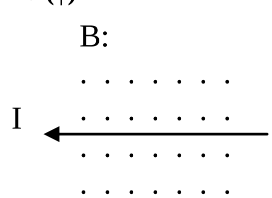
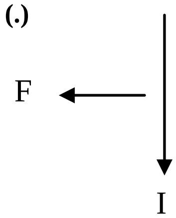
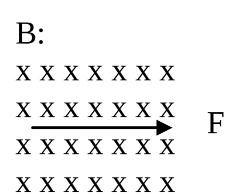
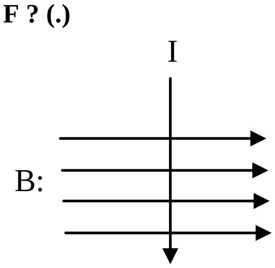
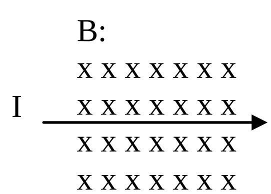
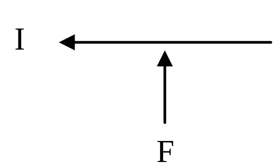
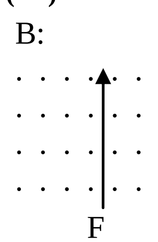


3. These are for predicting the location of the North Pole of an electromagnet or loop of wire. You wrap the **fingers** of your right hand in the **direction of the current** in the loop or solenoid, and your **thumb** is the **North Pole**.

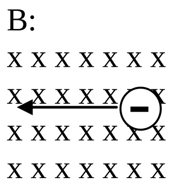
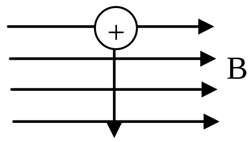
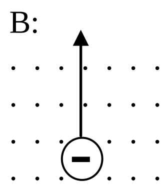
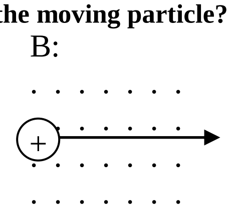
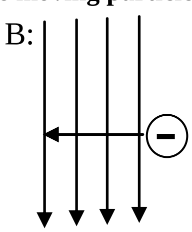
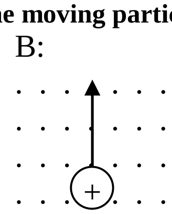
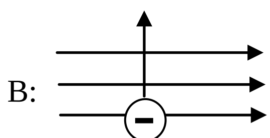
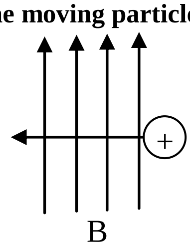
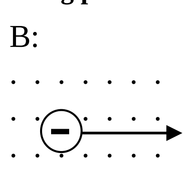
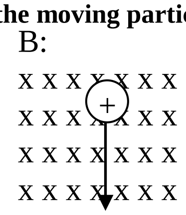
"x" = into the page
"." = out of the page

Which way does the north pole point?(.) 	**Which way does the north pole point? (x)** 	**Which way does the north pole point? (←)**  **(Current flows up on Front of coil)**	**Which way does the current flow on the front side of this coil? (←)** 
Which way does the north pole point? (.) 	**Which way does the north pole point? (x)** 	**Which way does the north pole point? (↑)**  **(Current flow L to R on Front of coil)**	**Which way does the current flow on the front side of this coil? (↓)** 
Which way does the north pole point? (x) 	**Which way does the north pole point? (.)** 	**Which way does the north pole point? (↑)**  **(Current flow L to R on Front of coil)**	**Which way does the current flow on the front side of this coil? (↑)** 
Which way does the north pole point? (x) 	**Which way does the north pole point? (.)** 	**Which way does the north pole point? (→)**  **(Current flows down on Front of coil)**	**Which way does the current flow on the front side of this coil? (→)** 
Which way does the north pole point? (x) 	**Which way does the north pole point? (.)** 	**Which way does the north pole point? (↓)**  **(Current flow R to L on Front of coil)**	**Which way does the current flow on the front side of this coil? (↑)** 

4. This is the right hand rule for the force on a wire. Your **index finger** goes in the direction of the **current**, your **middle finger** goes in the direction of the **B field**, and your **thumb** is in the direction of the **force on the wire**. (Assuming you are making the Physics gang sign)

F ? (←) 	**F ? (.)** 	**B ? (That causes the force) (↓)** 	**I ? (↓)** 
F ? (→) 	**F ? (x)** 	**B ? (That causes the force) (←)** 	**I ? (.)** 
F ? (x) 	**F ? (.)** 	**B ? (That causes the force) (.)** 	**I ? (x)** 
F ? (.) 	**F ? (↑)** 	**B ? (That causes the force) (.)** 	**I ? (↓)** 
F ? (.) 	**F ? (↑)** 	**B ? (That causes the force) (.)** 	**I ? (←)** 

5. This is the right hand rule for particles. Your **index finger** goes in the **direction the charge is moving**, your **middle finger** goes in the direction of the **B field**, and your **thumb** is in the direction of the **force** on the particle. **Remember that the force will be opposite this for a <u>negative (-) charge</u>.**

Which way is the force on the moving particle? (↑) 	**Which way is the force on the moving particle? (.)** 	**Which way must a proton move to experience a northerly force in a vertically upward magnetic field? (w)** N W E S	**An electron moving south experiences a force to the west. B is what way? (vertically downward or x)** N W E S
Which way is the force on the moving particle? (←) 	**Which way is the force on the moving particle? (↓)** 	**Which way must a proton move to experience a vertically downward force in an easterly magnetic field? (n)** N W E S	**An electron moving east experiences a force to the north. B is what way? (vertically upward or .)** N W E S
Which way is the force on the moving particle? (x) 	**Which way is the force on the moving particle? (→)** 	**Which way must a proton move to experience a southerly force in a vertically downward magnetic field? (w)** N W E S	**An electron moving south experiences a force vertically downward. B is what way? (e)** N W E S
Which way is the force on the moving particle? (.) 	**Which way is the force on the moving particle? (x)** 	**Which way must a proton move to experience a easterly force in a northerly magnetic field? (vertically downward or x)** N W E S	**An electron moving vertically upward experiences a force to the north. B is what way? (w)** N W E S
Which way is the force on the moving particle? (↑) 	**Which way is the force on the moving particle?(→)** 	**Which way must a proton move to experience a vertically upward force in a northerly magnetic field? (e)** N W E S	**An electron moving east experiences a force to the vertically downward. B is what way? (n)** N W E S