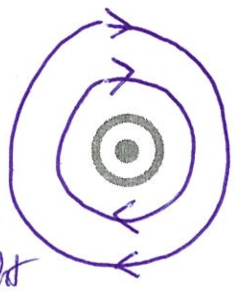
Review for Quiz

1. Draw the direction of field lines around these wires (always draw at least **two field lines**).

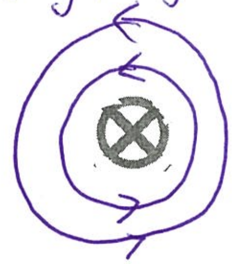
Use the Left hand Rule!

Thumb points to + terminal (where electrons are going), fingers curl in direction of field lin

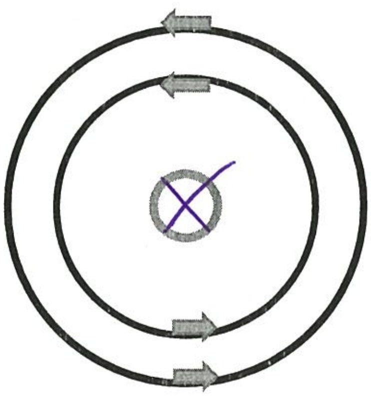
This symbol means the electrons are coming out of the page, right at you

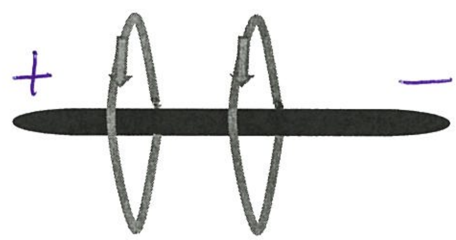


Electrons going into the page

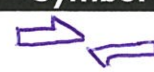
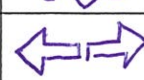
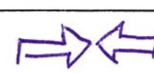


2. Determine the direction of the electrons given the magnetic field lines.





3. Give each mechanical constraint being described below, draw a symbol for it, and state the type of deformation associated with it as well.

Situation	Constraint	Symbol	Deformation
Using scissors to cut paper.	shearing		fracture
Sitting on an uncomfortable swings that folds around you.	deflection		elastic
Bungee jumping.	tension		elastic
Crushing a can.	compression		plastic
Putting clothes on a clothesline, causing it to permanently sag.	deflection		plastic
Winds twisting the Tacoma Narrows Bridge in 1940.	torsion		fracture

4. Check out the flowchart on page 72 of your textbook. Explain this flowchart in your own words.

Everytime we transfer or transform energy, only some is useful, the rest is "lost" as heat. Because there are multiple transfers / transformations, this system is very inefficient.

transfer = passing it on
transform = changing type

5. Fill in the following blanks:

a. Light from the sun is called radiant energy. When it hits a solar panel, it is transformed (transferred/transformed) into electrical energy.

b. No longer allies, Jessica shoves Jessica, causing her to fall to the ground. This is an example of a transfer (transfer/transformation) of mechanical energy from Jessica to Jessica.

c. On a windy day, you hear wind chimes outside a window. This is a transformation (transfer/transformation) of energy from wind energy to acoustic / sound energy.

d. You are about to attempt a 3 pointer at the buzzer to win Game 7 of the NBA finals. Fortunately, you've eaten plenty of food beforehand. This food has chemical energy in the bonds of its glucose molecules. You are transforming (transferring/transforming) it to mechanical energy, which allows our muscles to move and (hopefully) make the basket.

6. As proven by the flowchart on p. 72, some cars are only 12% efficient at transforming energy from their fuel to mechanical energy that spins the wheels. How much useful energy (to make the wheels go) is there if there is 78 000 000 000 J of energy available from the fuel?

$EE = \frac{\text{Useful}}{\text{Consumed}} \times 100$ or $\frac{12}{100} = \frac{x}{78\,000\,000\,000\ \text{J}}$

$= 9\,360\,000\,000\ \text{J}$

7. An electric heater that is 42% energy efficient uses 75 kWh of electrical energy. How much energy is "lost"?

$\frac{42}{100} = \frac{x}{75\ \text{kWh}}$ $= 31.5\ \text{kWh}$ $(75 - 31.5)\ \text{kWh} =$

43.5 kWh "lost"

8. Refer to the electric heater in the previous question. How much power is consumed if this heater is used for 5 days in a row, nonstop?

$E = P\Delta t$ $\Delta t = 5 \text{ days} \times 24 \text{ hrs/day} = 120 \text{ hrs}$

$E = 75\ \text{kWh}$

$P = ?$

$P = \frac{E}{\Delta t}$

$= \frac{75\ \text{kWh}}{120\ \text{hr}} = 0.625\ \text{kW}$

$= 0.625$ kW or 625 W