CONCEPT: BOHR EQUATION

- The **Bohr Equation** is used to calculate the energy transition of an electron as it moves from one shell to another.

Bohr Equations

This formula is used when dealing with **two orbital levels** and **energy**.

Bohr Equation Formula (Energy)

$$\Delta E = -(\_\_\_)\left(\frac{1}{\_\_\_\_} - \frac{1}{\_\_\_\_}\right)$$

- ☐ Δ**E =** energy change for electron transition in J.
- ☐ ____ = Rydberg Constant = _____ J.
- ☐ _____ = Final orbital level.
- ☐ _____ = Initial orbital level.

This formula is used when dealing with **two orbital levels** and **wavelength**.

Bohr Equation Formula (Wavelength)

$$\frac{1}{\lambda} = -(\_\_\_)\left(\frac{1}{\_\_\_\_} - \frac{1}{\_\_\_\_}\right)$$

- ☐ λ = Wavelength in meters.
- ☐ ____ = Rydberg Constant = _____ m^{-1}.

EXAMPLE: What is the energy of a photon (in Joules) released during a transition from n = 4 to n = 1 state in the hydrogen atom?

PRACTICE: What is the wavelength of a photon (in nm) absorbed during a transition from the n = 2 to n = 5 state in the hydrogen atom?

CONCEPT: BOHR EQUATION

PRACTICE: Determine the end (final) value of n in a hydrogen atom transition, if the electron starts in n = 5 and the atom releases a photon of light with an energy of 4.5738×10^{-19} J.

PRACTICE: An electron releases energy as it moves from the 6^{th} shell to the 3^{rd} shell. If it releases 4.25×10^{9} kJ of energy at a wavelength of 915.7 nm, how many photons were released in the process?