INTRO TO ROTATIONAL KINETIC ENERGY

● Remember**:** If you have ***linear*** speed **(____),** you have ***linear*** kinetic energy → $K_L = ½ m v^2$

- If you have ***rotational*** speed **(____),** you have ***rotational*** kinetic energy → $K_R =$ _____

- If you are moving AND rotating, you have _____ AND _____ → **K =** _____

- Remember**:** For Point Masses **(**R=0**), I =** _____**.** For Shapes/Rigid Bodies**,** we get **I** from a Table Look-up**.**

EXAMPLE**:** A basketball player spins a basketball around itself, on top of his finger, without the ball moving sideways. The ball has mass 0.62 kg, diameter 24 cm, and spins at 15 rad/s. Calculate the ball's linear, rotational, and total kinetic energy**.**

PRACTICE: ROTATIONAL ENERGY / ENERGY IN FLYWHEEL

PRACTICE**:** A flywheel is a rotating disc used to store energy. What is the maximum energy you can store on a flywheel built as a solid disc with mass 8×10^4 kg and diameter 5.0 m, if it can spin at a max of 120 RPM**?**

EXAMPLE: ROTATIONAL ENERGY / RE-DESIGN FLYWHEEL

EXAMPLE**:** You are tasked with re-designing a solid disc flywheel to decrease its radius by half. How much mass must the new flywheel have, relative to the original design, so that it can store the same amount of energy**?**

PRACTICE: ROTATIONAL ENERGY / FIND MASS

PRACTICE**:** When solid sphere 4 m in diameter spins around its central axis at 120 RPM, it has 10,000 J in kinetic energy**.** Calculate the sphere's mass**.**