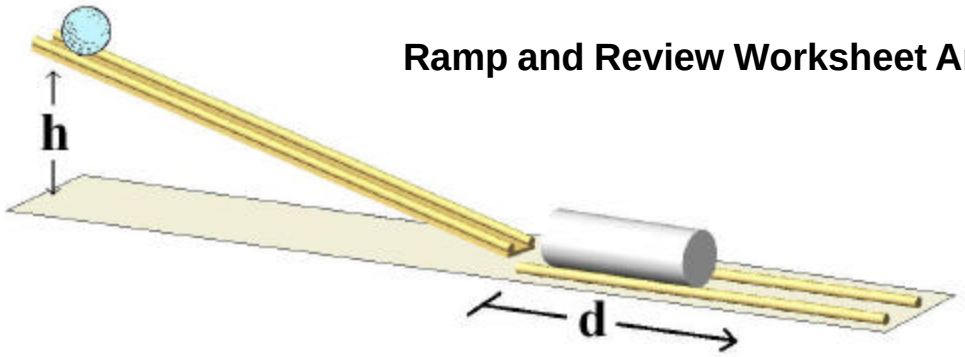
Name: _____ **Date:** _____



Ramp and Review Worksheet Answers

1. Measure and record the mass of the golf ball. m_{ball} = _____kg

2. Measure and record the height, **h**, of the yardstick. h = _____m

3. Run several trials of the ball rolling down the track and into the cup. Record the average value of how far the cup slides. d = _____m

4. What was the potential energy of the ball at height **h**? *PE* = ($m_{ball} \times g \times h$) J

5. What was the kinetic energy of the ball right before it hit the cup? *KE* = (same as #4) J

6. What was the velocity of the ball right before it hit the cup? $\left(V = \sqrt{\frac{2 \cdot KE}{m_{ball}}}\right)$ m/s

7. What was the ball's momentum right before it hit the cup? Momentum = ($m_{ball} \times V$) kg m/s

8. How much work did friction do to stop the cup? Work from friction = (negative of #4 and #5) J
   Hint: The kinetic energy of the ball + the work done by friction should equal zero.

9. Using the distance the cup slid, **d**, and the work done by friction, what was the frictional force on the cup? Force = (#8 ÷ d) N

Energy of Motion Equations

Potential Energy

$PE = m \times g \times h$

Kinetic Energy

$KE = ½ \times m \times V^2$

$V = \sqrt{\frac{2 \times KE}{m}}$

Momentum = $m \times V$

Work and Force

$W = F \times d$

$F = W \div d$

Where:

m = mass
g = gravity (9.81 meters/sec^2)
h = height
V = velocity
F = force
d = distance