#1

A ball of mass 'm' travels at velocity 2V. The ball is hit by a racket and rebounds with speed 3V. What is the magnitude of the impulse delivered by the racket?

Your answer should be in terms of 'm' and 'v'.

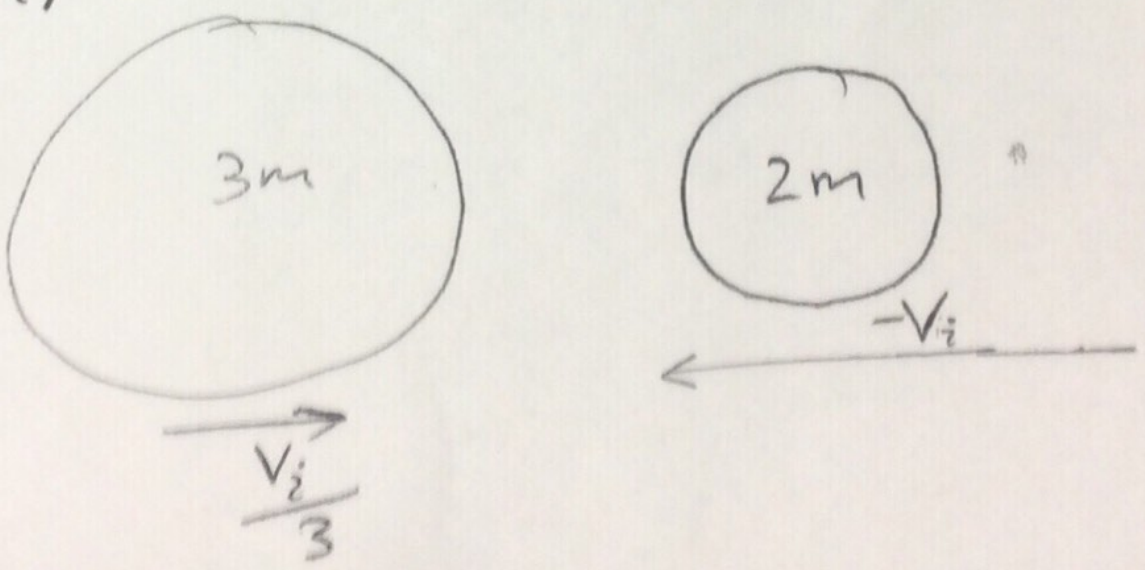
#2 Object 2 has 3 times the mass of object 1. Object 1 & 2 collide in a perfectly inelastic collision. After impact, what fraction of object 1's kinetic energy moves the now combined mass? Assume object 2 was initially at rest before the collision.

$$\text{Fraction} = K_f / K_i$$

#3

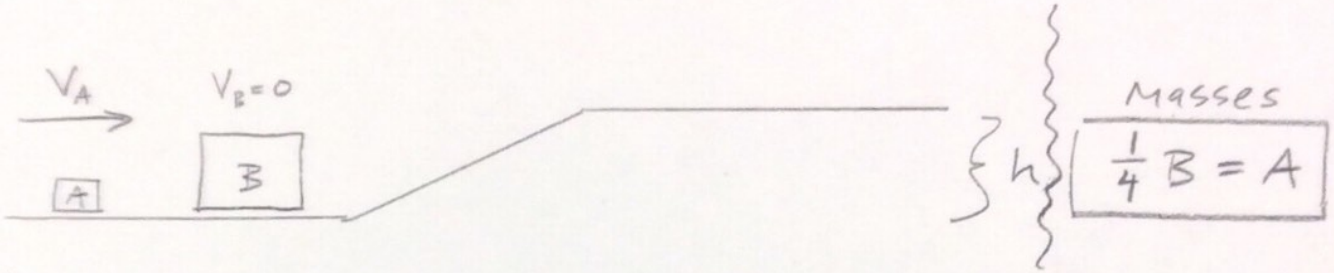
A disc of mass 2m is moving horizontally to the left on a table without friction on which it collides and sticks to a second disc with mass 3m. The second disc was moving to the right at 1/3 the speed of the 2m disc.

1. What is the literal equation of the composite body's immediate kinetic energy after impact? Use $V_i$, m and the appropriate constants.

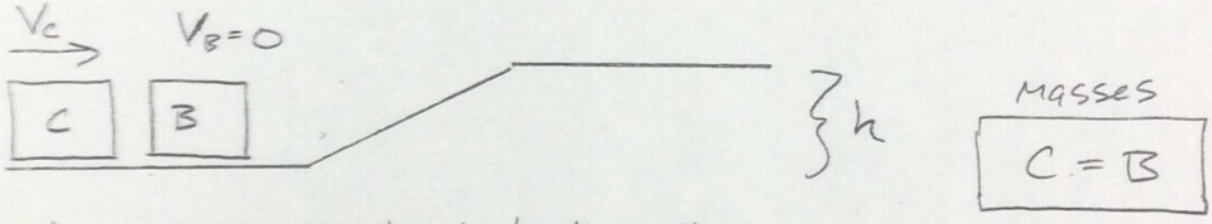


#4

Assume no friction. Masses C=B=(4·A)

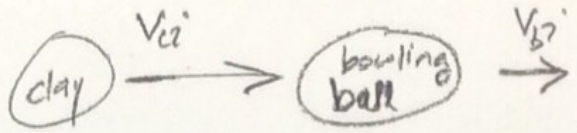



1. A and B experience a completely elastic collision. Let $V_A$ represent the minimum initial speed for A that allows B to make it to the top of the ramp. The mass of A is 1/4 of B. Using conservation of momentum ($\Sigma p_i = \Sigma p_f$), write a literal equation for $V_B$ in terms of $V_A$. Use 'm' for the mass of A. Assume $V_A$ final is zero.




2. C makes a completely inelastic collision with B such that both stick together. What is the minimum initial velocity of C such that C and B stuck together make it to the top of the ramp? Express your answer in terms of $V_A$.

#5




A large clay ball and a bowling ball travel in the same direction. The clay ball collides with a bowling ball.

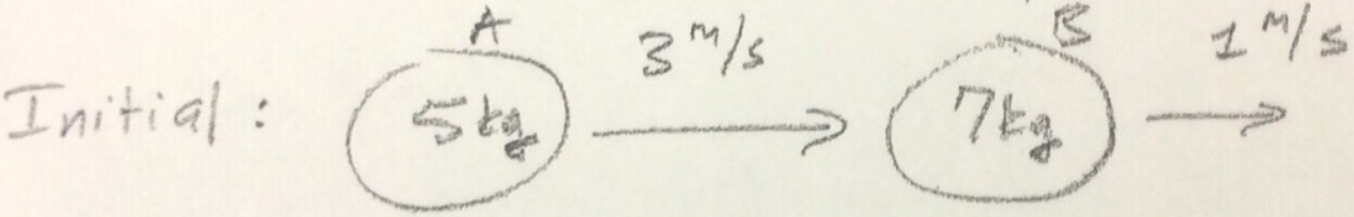
Will the bowling ball have more final velocity if the clay ball (a) sticks to the bowling ball, (b) bounces back the opposite direction or (c) does not stick to the bowling ball but continues to travel the same direction.

?

Not on the exam

#6

Assume a perfectly elastic collision.




What are the final velocities of A and B?

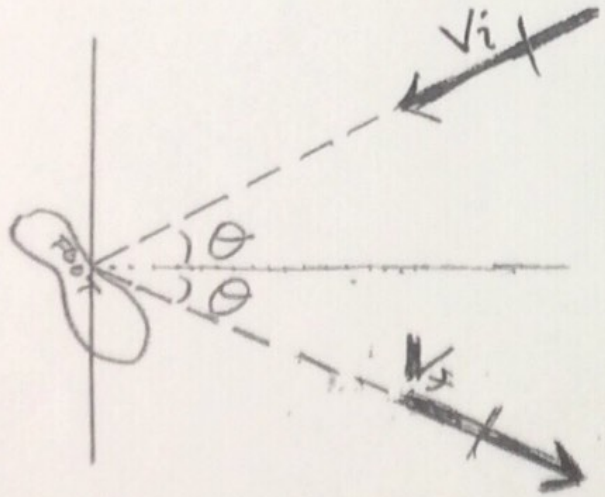
USE: $V_{Ai} - V_{Bi} = V_{Bf} - V_{Af}$

$$\sum \vec{P}_i = \sum \vec{P}_f$$

Not on the exam.

#7

A soccer player kicks a soccer ball such that it has the same velocity leaving her foot as it did when it first contacted her foot. The angle that the ball rebounds from her foot is the same as the incoming angle with respect to the normal




1. What is the literal equation for the impulse of the ball on the foot? Use only $m_{ball}$, $V_i$, $\theta$ and any constants or trig identities as needed.

2. What is the literal equation for the impulse of the ball on the foot if $V_f = 2V_i$?