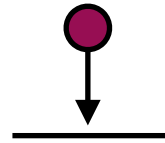


## Week 6: Momentum Additional Homework

1. A 2.5kg Superball hits the floor with a speed of 5m/s. The floor exerts an average normal force of 1000N on the ball for 0.02s, and the superball bounces back up into the air. What is the superball's speed immediately after the collision?

	$y$
$\vec{p}_i$	
$\vec{J}$	
$\vec{p}_f$	

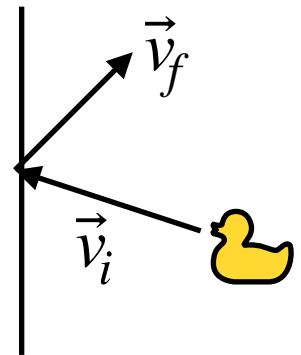


2. A 0.4kg rubber duck hits a wall which exerts an average normal force of 250N on the duck over 8ms. If the duck's initial velocity is  $(-3, +1)\text{m/s}$ , what is the duck's final

a) velocity and

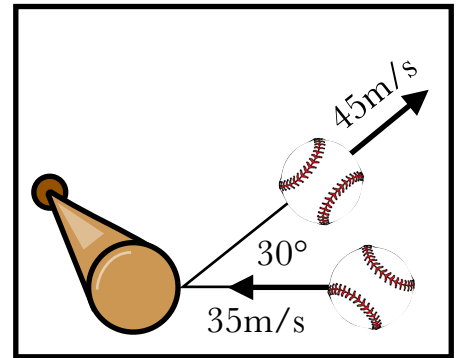
b) speed?

c) Did the duck slow down or speed up during hte collision?



	$x$	$y$
$\vec{p}_i$		
$\vec{J}$		
$\vec{p}_f$		

3. A 140g baseball is struck by a baseball bat when the baseball is moving horizontally at 35m/s. After the ball hits the bat, it is moving at 45m/s, 30° above the horizontal. If the baseball was in contact with the bat for 7ms, what is the magnitude of the average force  $|F_{avg}|$  on the ball?

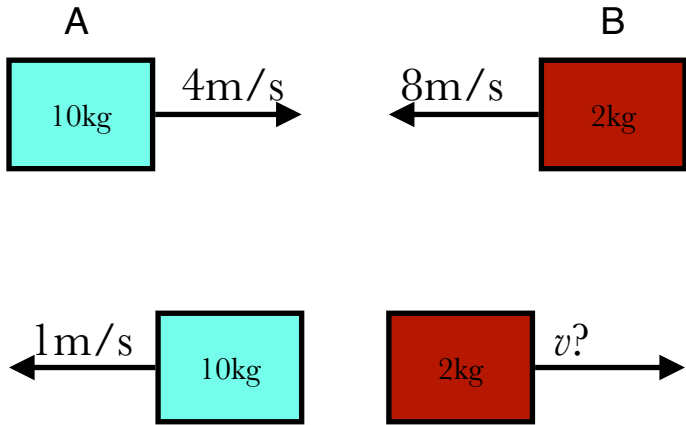


	$x$	$y$
$\vec{p}_i$		
$\vec{J}$		
$\vec{p}_f$		

4. A 10kg block and a 2kg block collide with the velocities shown.

a) What is the total momentum of the two blocks before the collision?

b) What is the velocity of the 2kg block after the collision?



$\vec{p}_{Ai}$	
$\vec{p}_{Bi}$	
$\vec{p}_{Af}$	
$\vec{p}_{Bf}$	