

Big Exam! #2

1. You fire a 5g bullet into a 1 kg mass which embeds itself into the block. The bullet is well known to have a speed of 400 m/s. The mass slides 2.0 meters on a smooth surface on which the block is free to slide. The block then compresses a spring as shown. The spring constant is 1000 N/m. We want to find the speed of the block immediately after the collision with the bullet and the compression of the spring. – use other side if necessary.



- Using the lens approach, explain how you will go about finding the compression of the spring.
- $\vec{v}_{Block} =$
- $\Delta x_{Spring} =$ _____
- What if the bullet and the block instead had a perfectly elastic collision? Please describe best you can how this would have changed your answers above.
- About how long did this process take from the moment the bullet hit the block until the spring was compressed?

