Panel 1

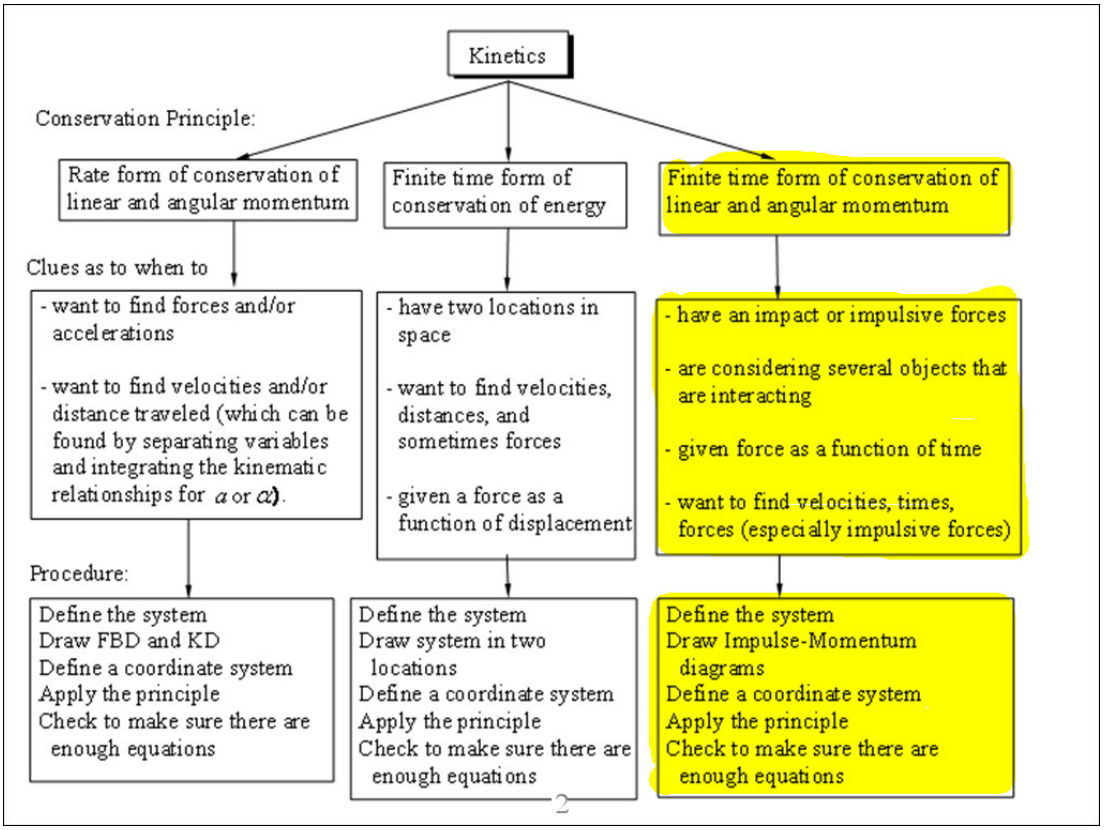
ES204 Mechanical Systems

Impact Day 2 of 2
Lecture 07

Dr. Fisher

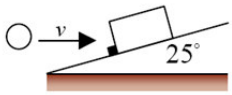
1

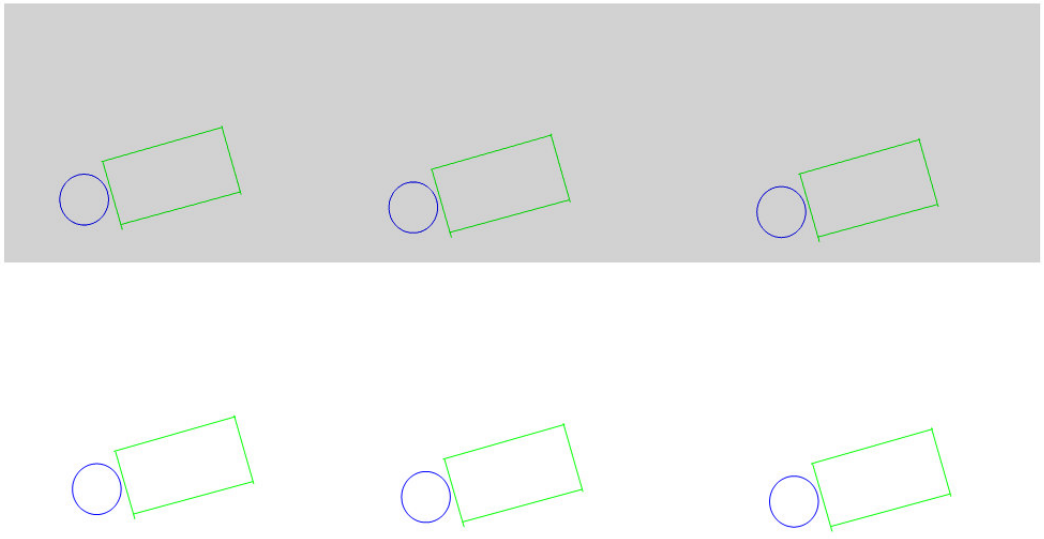
Panel 2



Panel 3

A 1 kg ball moving horizontally at 12 m/s strikes a 10 kg block. The coefficient of restitution of the impact is e=0.6., and the coefficient of kinetic friction between the block and the inclined surface is 0.4. What distance does the block slide before stopping?





3

Panel 4

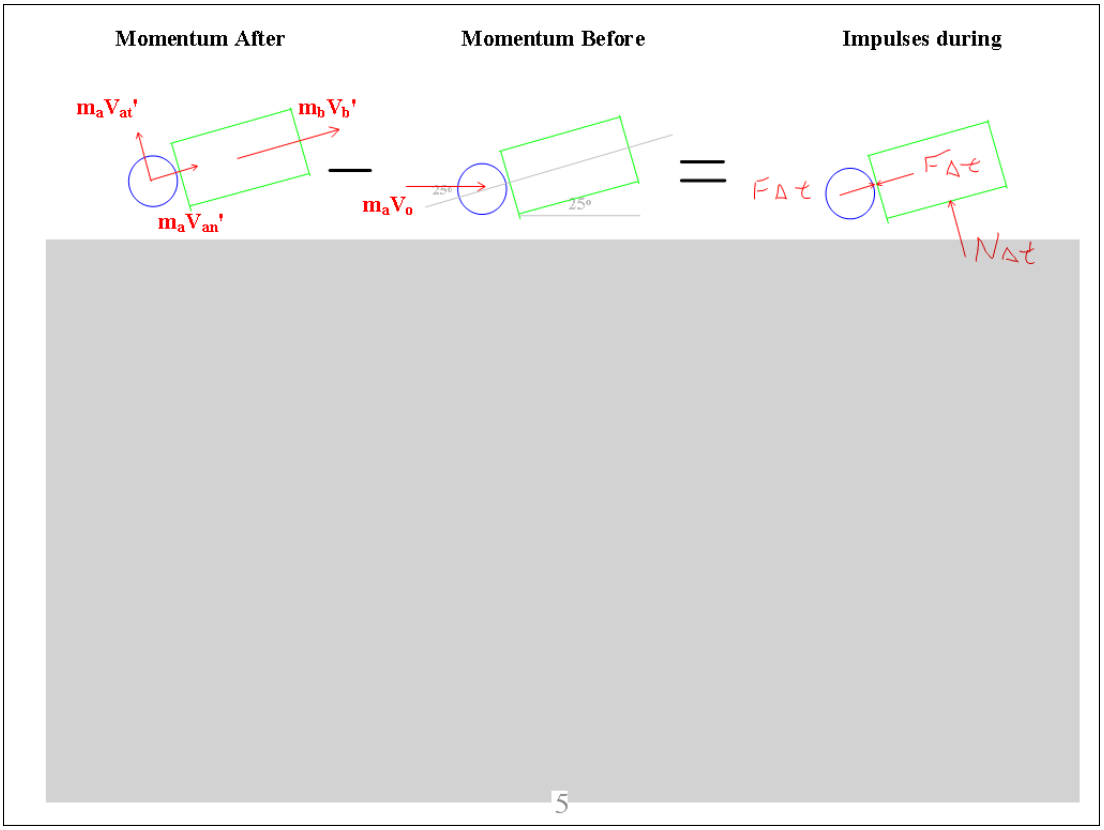
Momentum After **Momentum Before** **Impulses during**

Which system do you want to choose? Just A, Just B, or Both

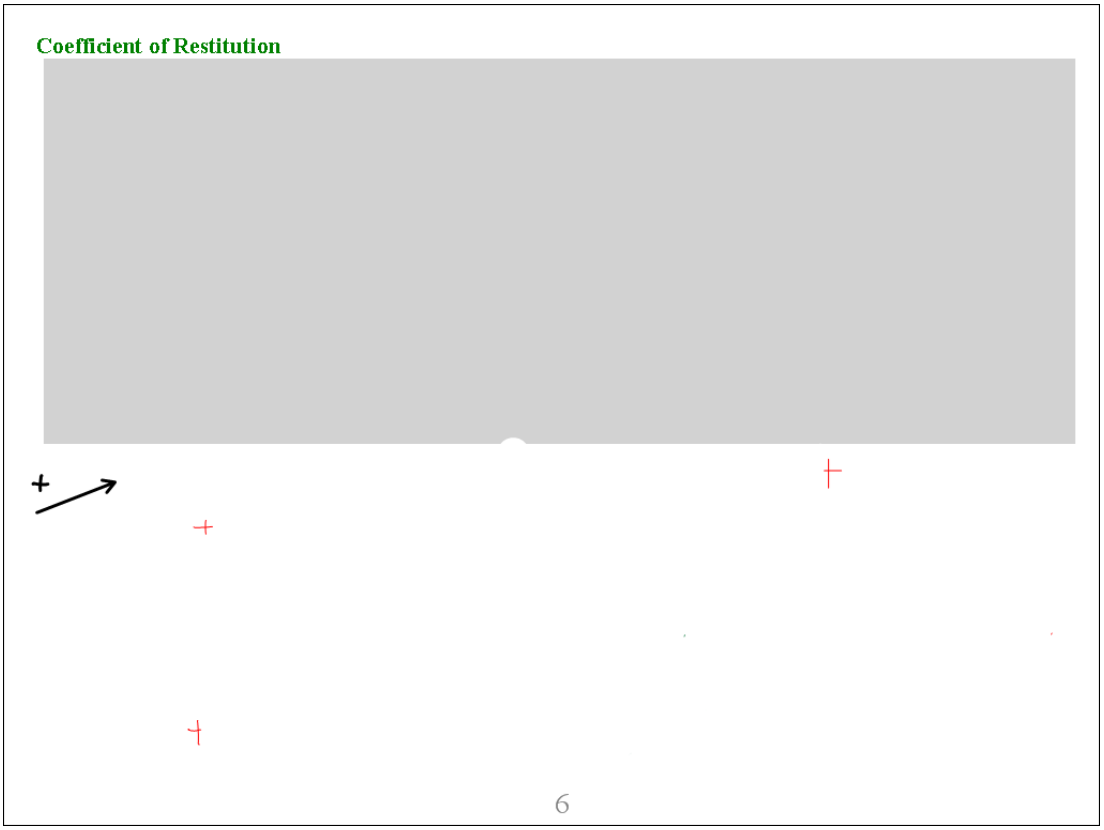
Which direction do you want to evaluate?

4

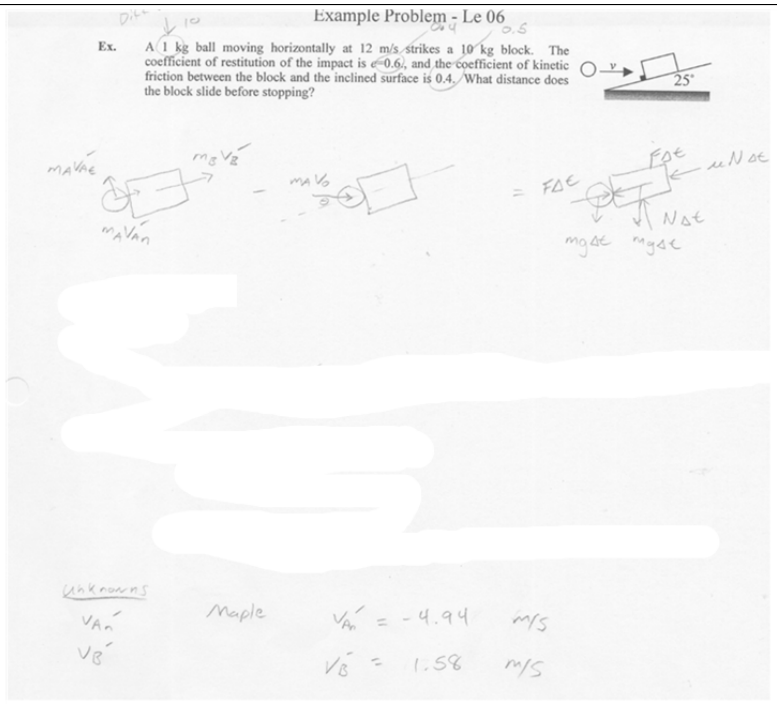
Panel 5



Panel 6



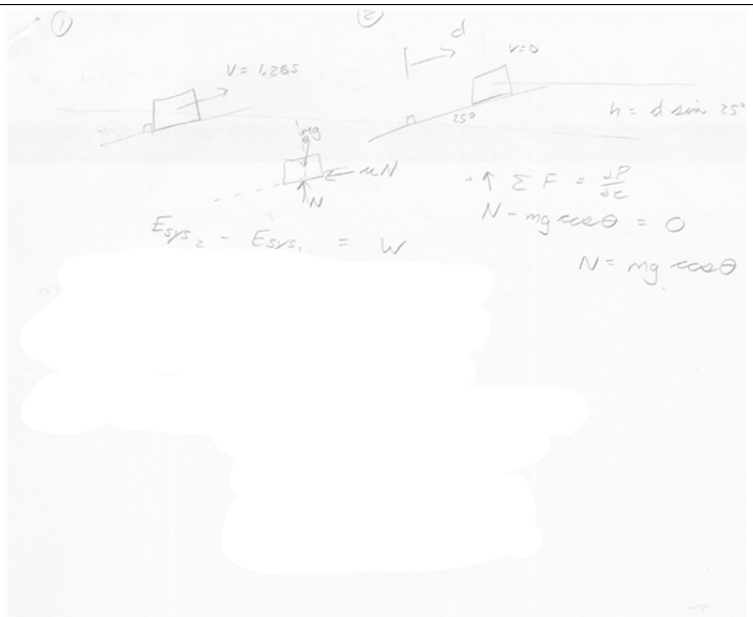
Panel 7



Space for solution if you made mistakes

7

Panel 8



Energy equation

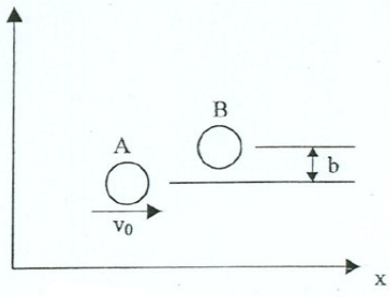
Work done on the block

8

Panel 9

a) Determine the velocity of A and B after impact
b) Show that if e=1 the final velocities form a right angle

Da = Db = 3'
b = 1.5"
e = 0.8
B starts from rest



Momentum After | Momentum Before | Impulses during



Momentum After | Momentum Before | Impulses during



9

Panel 10

Momentum After | Momentum Before | Impulses during

Which system do you want to choose? Just A, Just B, or Both

Which direction do you want to evaluate?

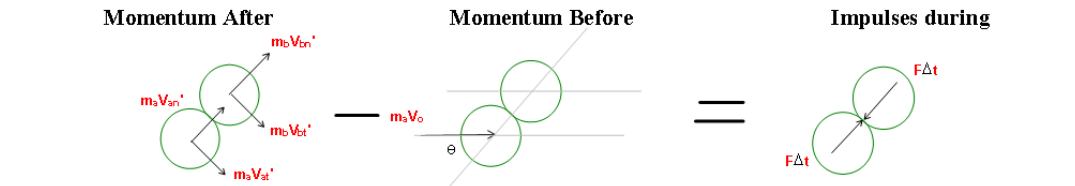
System A

System B

Both together

10

Panel 11



11

Panel 12

Coefficient of Restitution

$$e = -\frac{V_{B_N}' - V_{A_N}'}{V_{B_N} - V_{A_N}}$$

12