PASS

PEER ASSISTED STUDY SESSIONS

MOCK EXAM

FOR PRACTICE ONLY

COURSE: ECOR 1101 **FACILITATOR:** Andriy Predmyrskyy

It is **most beneficial** to you to write this mock midterm **UNDER EXAM CONDITIONS**. This means:

1 • Complete the midterm in 3 hour(s).
2 • Work on your own.
3 • Keep your notes and textbook closed.
4 • Attempt every question.

After the time limit, go back over your work with a different colour or on a separate piece of paper and try to do the questions you are unsure of. Record your ideas in the margins to remind yourself of what you were thinking when you take it up at PASS.

The purpose of this mock exam is to give you practice answering questions in a timed setting and to help you to gauge which aspects of the course content you know well and which are in need of further development and review. Use this mock exam as a ***learning tool*** in preparing for the actual exam.

Please note:

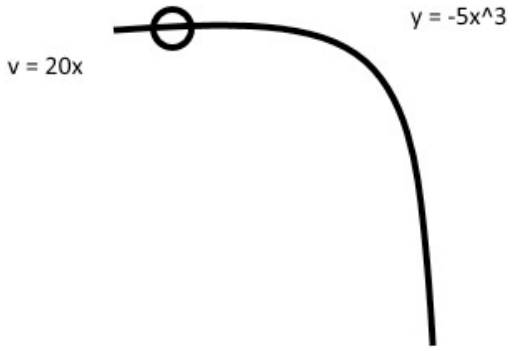
- Come to the PASS workshop with your mock exam complete. During the workshop you can work with other students to review your work.
- Often, there is not enough time to review the entire exam in the PASS workshop. Decide which questions you most want to review – the Facilitator may ask students to vote on which questions they want to discuss in detail.
- Facilitators do not bring copies of the mock exam to the session. Please print out and complete the exam before you attend.
- **Facilitators do not produce or distribute an answer key for mock exams.** Facilitators help students to work together to compare and assess the answers they have. If you are not able to attend the PASS workshop, you can work alone or with others in the class.

Good Luck writing the Mock Exam!!

Dates and locations of mock exam take-up

Saturday April 8th 2017 5:00 PM – 8:00 PM, ME 3380

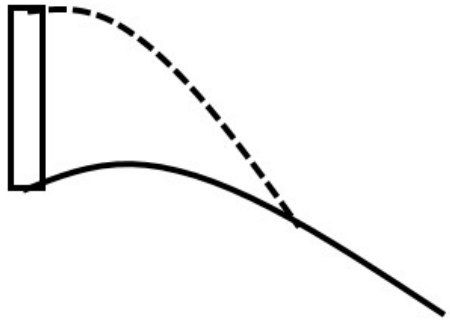
1. The Velocity and position functions are given for the following particle.
Find the magnitude of the Radius of Curvature, Normal Accelerations, Tangential Accelerations, Normal Velocity, Tangential Velocity for x = 1 and x = 20.



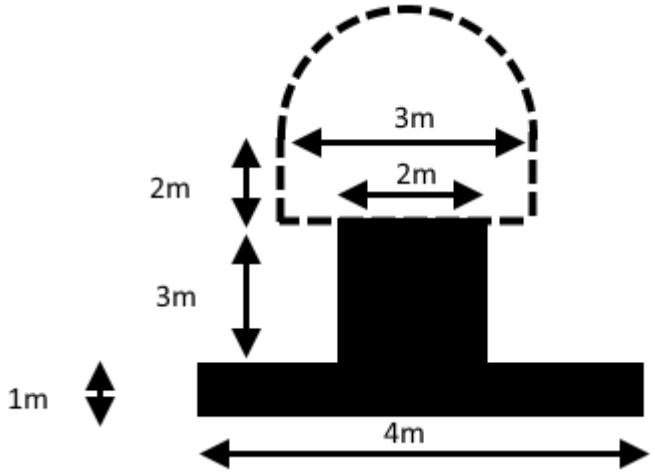
2. A Ball is thrown perfectly horizontally with a speed of 2 m/s from a tower of height 10m , towards a hill defined by the function:

$y = -0.5 (x-1)^2 + 2.$

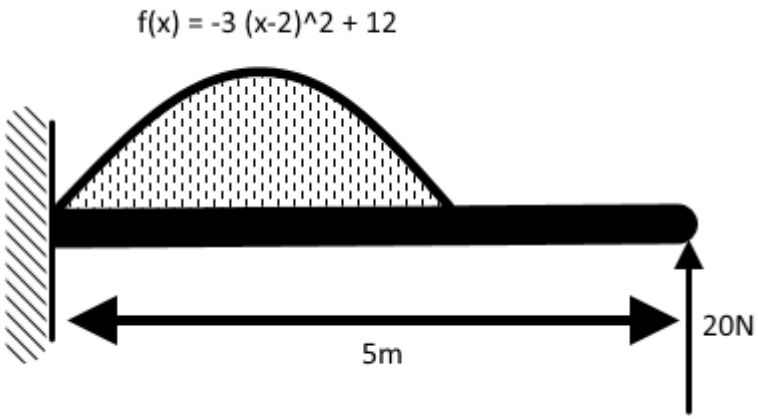
At what point does the ball hit the hill? What velocity does it have at this point?



3. What is the y location of the center of gravity of the following shape? The mass of the shaded area is 1000 kg/m^3 and the mass of the clear region is 500 kg/m^3.



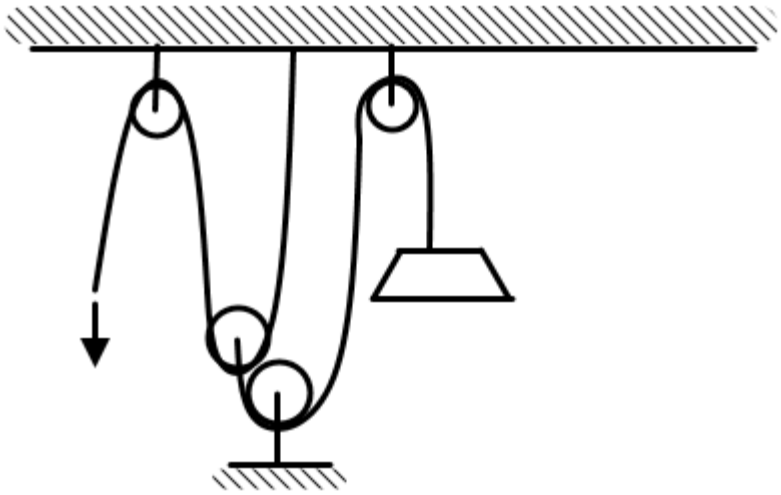
4. Given the following beam, determine the largest internal force, and largest internal moment:



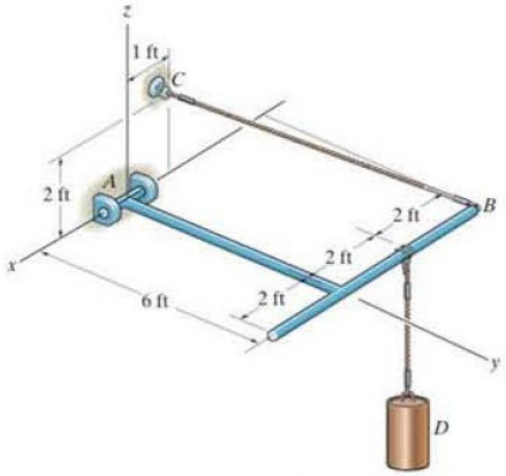
If the beam breaks at internal moments greater than 1000 N*m and internal forces greater than 100N, Does the beam break?

5. If the block in the following diagram has a weight of 50N, what force P must be applied to keep it aloft?

If the rope is then pulled down at a speed of 2 m/s, at what speed does the block rise?

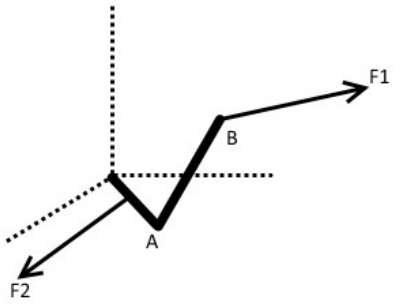


6. What force of tension must be present in the cable BC in order for the following system to be at equilibrium?

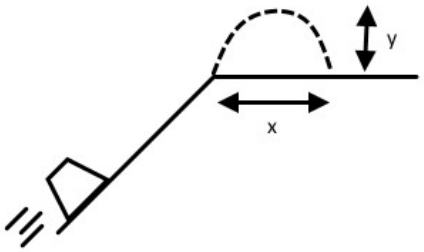


Prob. 5–76

7. What is the moment present about the axis AB if F1 = -F2 = (3,4,5) and point A is at (2,1,0) and point B is at (5,1,3), F1 acts at point B and F2 acts at (1,0.5,0).



8. A 20 kg block is given an initial velocity of 20 m/s along the plane of a flat smooth hill. The hill is 20 m tall and inclined at 45 degrees. When the block reaches the top of the hill, what velocity does it have? If it reaches the top, how high does it go before falling back to the top of the hill? At what distance x does it fall back to the top of the hill? What impulse is provided by the ground if it comes to a complete rest as it lands?



9. A certain Luxury car has it's acceleration modelled by the function a = 3*e^(5t). Draw and label the velocity and acceleration graphs for this car.

10. On a popular carnival ride, patrons are placed in a seat held a distance away from a central axis and the ride is spun. If the ride has the below dimensions, and the ride is spun with a 100 kg patron and the rider stays at a constant 1m radius from the central shaft, what is: The tension in the chain, the angle of the rider, the height of the rider above the ground, their normal acceleration, and the level of enjoyment of the rider, in percent?