



Faculty of Engineering and Technology
Department of Mechanical and Mechatronics Engineering
First Examination – Fall 2018

ENME 232: Dynamics

Date of Examination: 26/10/2018

Student ID: _____

Time duration: 90 minutes

Total Marks: 100

This exam contains 7 pages (including this cover page) and 3 problems. Check to see if any pages are missing. Enter your Student ID number on the top of this page, and at the bottom of every page, in case the pages become separated.

You may *not* use your books, notes, equation sheets, or any other reference on this exam. You can use your own calculator only. Borrowing calculators is not allowed.

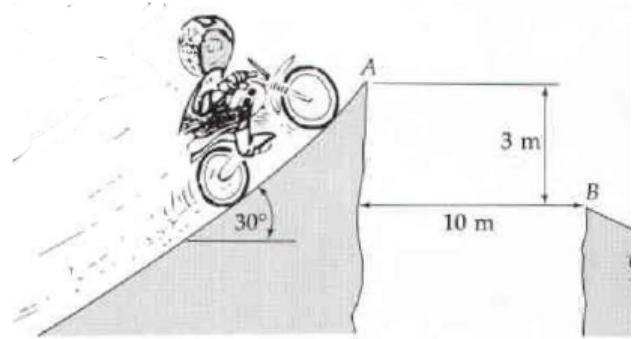
You are required to show your work on each problem on this exam.

Do not write in the table below.

Problem	ABET SO	Points	Score
1	(a)	30	
2	(e)	40	
3	(e)	30	
	Total	100	

1) The motorcycle in the figure is to be driven by a stunt man. Find the minimum takeoff velocity at A for which the motorcycle can clear the gap and land at point B . Also, find the magnitude of the final velocity of the motorcycle at B .

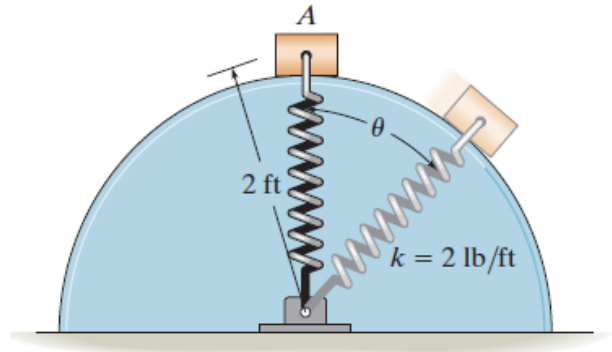
Clearly label your coordinate system(s).



30 marks

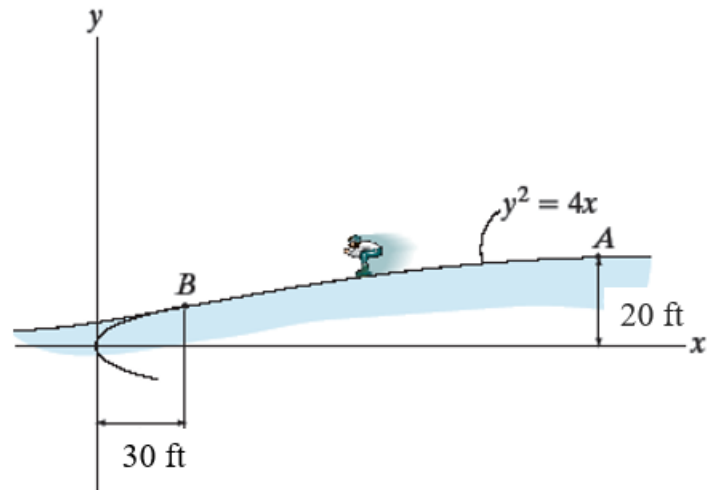
2) The 2 lb block is released from rest at A and slides down along the smooth cylindrical surface. If the attached spring has a stiffness $k = 2\text{ lb/ft}$, determine the unstretched length so that it does not allow the block to leave the surface until $\theta = 60^\circ$.

Draw the necessary free body diagram(s) and clearly label your coordinate system(s).



40 marks

3) The 150 lb skater passes point A with a speed of 8 ft/s. Determine his speed when he reaches point B and the normal force exerted on him by the track at this point. Note that the radius of curvature at B is 300 ft. Neglect friction. Draw the necessary free body diagram(s) and clearly label your coordinate system(s).



30 marks

