Set #7 - for Wednesday November 13

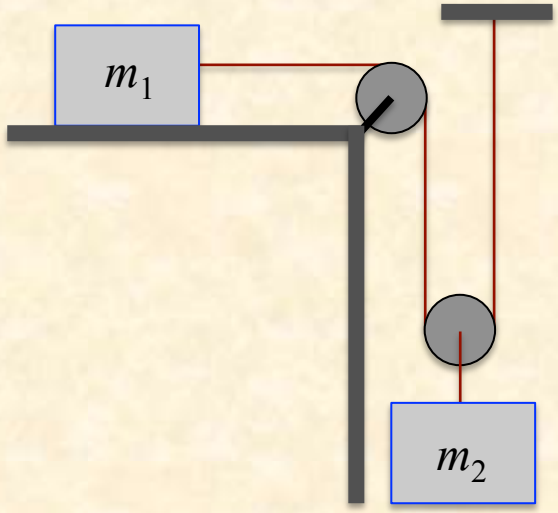
Read RHK Ch 11 (11.1-11.6); Ch 12 (12.1-12.3, 12.4-12.6)
K&K Ch 2 (p. 87-100); Ch 4 (p. 152-156, 158-161) Ch 8 (p. 152-154)

Solve

From RHK **Ch. 5** Problem 18
Ch. 11 Exercises 6, 31. Problems 11, 14
Ch. 12 Exercise 18. Problem 4

From K&K **Ch. 2** Problems 2.13, 2.17, 2.35, 2.37, **Extra credit 2.18**

Problem 1. In the system shown below the ropes and the pulleys are massless. There is no friction anywhere. Find the acceleration of each block.



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Problem 2. The engine of a racing car of mass m delivers a constant power P at full throttle. Assuming that friction is proportional to the velocity, find an expression for $v(t)$ if the car accelerates from a standing start at full throttle. Does your solution behave correctly as $t \to \infty$? (Power will be covered on Tuesday, November 12)

Problem 3a. Evaluate the work done by the force $\vec{F} = (x^3 + y^3)\hat{i} - 2xzy^2\hat{j} + (x + y + z)\hat{k}$ along the path defined by $y = x^2,\ z = 2$ and $0 \le x \le 1$.

Problem 3b. Repeat for the force $\vec{F} = \theta\hat{\theta}$ along a counterclockwise circular path of unit radius centered at the origin.

Good Luck, Dr. B