6.946 Assignment 1

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1.2: Degrees of freedom

(a) $18(= 6 * 3)$

(b) 2

(c) 4

(d) 1

(e) 1

(f) 1

1.3: Generalized coordinates

(a) For juggling pins 1, 2, 3 (in that order), specify the coordinates of two fixed points on the pin (in rectangular form with respect to an arbitrary origins).

(b) Fix an axis system, with origin at the fixed support point and z-axis on the rod. Specify x and y coordinates of the hanging point mass.

(c) Similar to two (b)'s. For second massless rod, fix an axis system with origin at fixed support point and z-axis on the rod. For first massless rod, fix an axis system with origin at second point mass and z-axis on the rod. Specify the x and y coordinates of each hanging point mass with respect to their own axis system.

(d) Fix an origin and direction on the curve. The single coordinate is the signed distance travelled on the curve from the origin.

(e) The single coordinate is an angle measuring the difference from an arbitrary fixed starting configuration.

(f) Same as (e).