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cannot produce deformation equilibrium of rigid bodies definition equilibrium is the state when all the external forces acting on a rigid body form a system of forces equivalent to zero there will be no rotation or translation the forces are referred to as balanced rigid body equilibrium is a dynamic equilibrium of a rigid body it occurs when the net force on the rigid body is zero the equations of rigid bodies in equilibrium are derived from the combination of newton s laws of motion newton s law of universal gravitation and a set of constraints on the motion of the rigid body two dimensional rigid bodies have three degrees of freedom so they only require three independent equilibrium equations to solve the six scalar equations of 5 3 3 can easily be reduced to three by eliminating the equations which refer to the unused z dimension equal and opposite forces acting on a rigid body may act so as to compress the body figure 19a or to stretch it figure 19b the bodies are then said to be under compression or under tension respectively strings chains and cables are rigid under tension but may collapse under compression a uniform rod of mass m and length 2a is held in equilibrium by a light inelastic string of length 2a and by a frictional force due to the rod s contact with a rough vertical wall the angle between the string and the rod is 60 as shown in the diagram below statics 3d rigid body equilibrium what are the similarities and differences between solving two dimensional and three dimensional equilibrium problems why are some three dimensional reaction couple moments available but not engaged what kinds of problems are solvable using linear algebra equilibrium of rigid bodies introduction most of the objects that one sees are in a state of equilibrium that is at rest or in a state of uniform motion many man made structures are designed to achieve and sustain a state of equilibrium and this in turn sets require visit ilectureonline com for more math and science lectures in this video i will introduce equilibrium of rigid bodies where sum of the forces 0 and sum of the moments 0 next let s go through how to solve 3d equilibrium problems with 3 force reactions and 3 moment reactions we go through multiple examples step by step and find reactions for different supports like

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