

# **Torque and Statics**

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## ***Recap***

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Statics

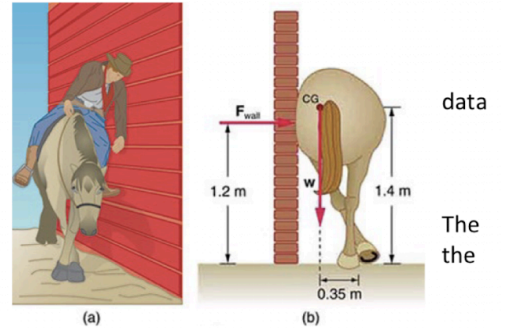
Torque

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### Practice

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Suppose a horse leans against a wall as in the figure, emulating a scene in the comedy movie Cat Ballou. Calculate the force exerted on the wall, assuming that the force is horizontal, while using in the schematic representation of the situation. Note that the force exerted on the wall is equal in magnitude and opposite in direction to the force exerted on the horse, keeping it in equilibrium. The total mass of the horse and rider is 500 kg. Take data to be accurate to three digits.



Two children push on opposite sides of a door during play. Both push horizontally and perpendicular to the door. One child pushes with a force of 17.5 N at a distance of 0.600 m from the hinges, and the second child pushes at a distance of 0.450 m. What force must the second child exert to keep the door from moving? Assume friction is negligible.

Two children of mass 20.0 kg and 30.0 kg sit balanced on a seesaw with the pivot point located at the center of the seesaw. If the children are separated by a distance of 3.00 m, at what distance from the pivot point is the small child sitting in order to maintain the balance?

A person carries a plank of wood 2.00 m long with one hand pushing down on it at one end with a force  $F_1$  and the other hand holding it up at .500 m from the end of the plank with force  $F_2$ . If the plank has a mass of 20.0 kg and its center of gravity is at the middle of the plank, what are the magnitudes of the forces  $F_1$  and  $F_2$ ?