Additional Exercises Ch 4, 5, 6

A–1: What is the minimal force a mother must exert to lift her 5.0–kg baby out of its crib?

A–2: On the moon, the gravity is 1/6 that of Earth. While on the moon, Buzz Aldrin carried on his back a support system that would weigh over 1760 N on Earth. a) What did the backpack weigh on the moon? b) What was its mass on the moon?

A–3: A common malady in runners who run on too hard a surface is shin splints. If a runner's 7.0–kg leg hits the pavement so that it comes to rest with an acceleration of $-200.0\ m/s^2$ on each hit, how much force must the runner's leg withstand on each step?

A–4: In the district soccer championship finals, Elizabeth kicks a 0.600–kg soccer ball with a force of 80.0 N. How much does she accelerate the soccer ball from rest in the process?

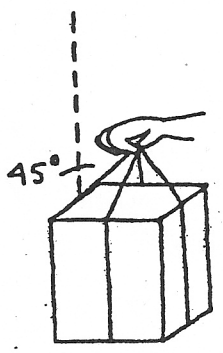
A–5: Barker is unloading 20–kg bottles of water from his delivery truck when one of the bottles tips over and slides down the truck ramp that is inclined at an angle of 30° to the ground. What amount of force moves the bottle down the ramp?

A–6: Molly, whose mass is 40.0 kg, is on her way to school after a winter storm when she accidently slips on a patch of ice whose coefficient of sliding friction is 0.060. What force of friction will eventually bring Molly to a stop?

A–7: In her physics lab, Eliza puts a 1.0–kg mass on a 2.0–kg block of wood. She pulls the combination across another wooden board with a constant speed to determine the coefficient of sliding friction between the two surfaces. If Eliza must pull with a force of 6.0 N, what coefficient of sliding friction does she calculate for wood on wood?

A–8: A 1250–kg slippery hippo slides down a mud–covered hill inclined at an angle of 18.0° to the horizontal. a) If the coefficient of sliding friction between the hippo and the mud is 0.0900, what force of friction impedes the hippo's motion down the hill? b) If the hill were steeper, how would this affect the coefficient of sliding friction?

A–9: Erma receives a 5.00–kg package in the mail tied with a string that goes around each side of the box, as shown. If Erma lifts the box by the string in the center so that each piece of string makes an angle of 45.0° with the vertical, what is the tension in each piece of string?



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