Problems

1. A 400-kg bear grasping a vertical tree slides down at constant velocity. What is the friction force that acts on the bear?

2. If a mass of 1 kg is accelerated 1 m/s^2 by a force of 1 N, what would be the acceleration of 2 kg acted on by a force of 2 N?

3. How much acceleration does a 747 jumbo jet of mass 30,000 kg experience in takeoff when the thrust for each of four engines is 30,000 N?

4. If you stand next to a wall on a frictionless skateboard and push the wall with a force of 30 N, how hard does the wall push on you? If your mass is 60 kg, what's your acceleration?

5. A firefighter of mass 80 kg slides down a vertical pole with an acceleration of 4 m/s^2. What is the friction force that acts on the firefighter?

Questions

1. How much work is done on a 75-N bowling ball when you carry it horizontally across a 10-m-wide room?

2. How much work is done on it when you lift it 1 m? What power is expended if you lift it this distance in 1 s?

3. What is its gravitational potential energy in the lifted position?