**Force Problem Analysis**

In the problems below, be sure to work through them just like we did in class, starting with Free Body Diagrams and Summation Equations.

   

1. A 200 kg box is pushed across a frictionless, horizontal surface with a force of 820 N. Determine the acceleration of the box.
2. If the box in the previous question encounters a rough surface, where the coefficient of kinetic friction between the box and the surface is 0.25, what is the acceleration of the box across this surface if it still experiences an applied force of 820 N?
3. A 125 kg box is pulled with a force of 200 N, at an angle directed 30° above the horizontal, across a frictionless, horizontal surface. Determine the acceleration of the box.
4. If, in the previous example, the coefficient of friction between the box and the surface was 0.10, what is the acceleration of the box?
5. A 40 kg sled is being dragged across a horizontal surface with a force of 150 N directed 37° above the horizontal at a constant speed. Determine the coefficient of kinetic friction between the sled and the ground.
6. A 50 kg box is pushed across a horizontal surface with an applied force that is directed 60° ***downward*** with a force of 100 N. If the coefficient of kinetic friction between the box and the surface is 0.08, what is the acceleration of the box?
7. A crane raises a 1500 kg load upward with a rope. If the tension in the rope is 20,000 N, what is the acceleration of the load?
8. A 2500 kg elevator accelerates downward at 3.2 m/s2. Determine the tension in the wire holding the elevator.

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