

Group Practice

Newton's 2nd Law

1. A sled is pulled across the ground with a force of 34 N at an angle of 31° above the horizontal. The Earth exerts a force downwards of 50 N (gravitational). The ground exerts a support force of 32.5 N. What is the net force on the sled?
2. The net force from the propeller on a 3.2 kg model airplane is 7.0 N forward. What is the acceleration of the airplane?
3. A plane taking off from an airport has a thrust/lift force in the forward direction of 38000 N at 32° above the horizontal. Wind resistance exerts a drag force of 5400 N directly backwards. The Earth exerts a force of 13000 N downwards (gravitational) on the plane. What is the net force on the plane (magnitude & direction)?
4. A soccer ball kicked with a net force of 13.5 N accelerates at 6.5 m/s^2 to the right. What is the mass of the ball?
5. An industrial worker on the second floor of a building pulls a crate straight up using a rope from the first floor to the second. The worker pulls with a force of 400 N upwards. The Earth exerts a force of 200 N downwards. The wind blows at an angle to the side and exerts a force of 12 N at 3° below the horizontal. What is the net force on the crate (magnitude & direction)?