

Introduction to Solving Force Problems

How to solve force problems

1. Read the question and visualize the situation, what information you have and what information you are looking for. Don't forget that if the problem tells you the acceleration, you essentially have the net force.

2. Draw a free body diagram

3. Solve $\mathbf{F_{net} = ma = \Sigma F}$ to find what you are looking for. You may need to solve this equation more than once, depending on the question.

1. Bob pulls a 10kg box to the right with a force of 50N.

- a) What is the net force?
- b) What is the normal force?
- c) What is the acceleration of the box?

2. Bob pulls a 10kg box to the right with a force of 50N. Sam pulls the box to the left with a force of 30N.

- a) What is the net force?
- b) What is the acceleration of the box?

3. A 1000kg rocket accelerates upwards at 5m/s^2 .

- a) What is the force of gravity of the rocket?
- b) What is the net force on the rocket?
- c) What force must its engine have?

4. A 50kg box is pushed to the right by a 100N force. What force do you have to push the box for the net force to be

- a) 300N right?
- b) 800N left?

5. A 0.5kg toy rocket exerts an upward thrust of 15N.

- a) What is the acceleration of the rocket?
- b) If the rocket wants to accelerate at 50m/s^2 , what thrust force does the rocket need?

6. A 1000kg car is driving super fast to the right at a constant velocity of 500m/s.

- a) What is the normal force on the car?
- b) What is the weight of the car?
- c) What is the net force on the car?

7. Describe a scenario where the normal force is not equal to the weight of an object.

8. A 500kg elevator is being pulled upwards by a rope with some tension force. Calculate the tension force if

- a) The elevator is moving up at a constant velocity of 2m/s
- b) The elevator is accelerating up at 1.5m/s^2
- c) The elevator is accelerating down at 1.5m/s^2 ,