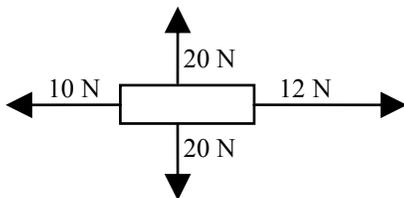


PHYSICS 11 FORCES & NEWTON'S LAWS WORKSHEET 1

1. Phoebe Physics pulls a wagon with a force of 80 N.
 - a) What is the net force if the force of friction between the wagon and the ground is 12 N?
 - b) If she uses 80 N to pull the wagon through a mud puddle, and the net force on the wagon is 38 N, what friction force acts on the wagon?
2. How much force is required to keep a 780 N box moving at constant velocity across the floor if the friction force between the box and the floor is 160 N?
3. A rocket weighs 2.0×10^7 N. Its engines exert 2.5×10^7 N of force at lift-off. What is the net force applied to the rocket?
4. Two children having a disagreement pull on a sled in opposite directions. One pulls with a force of 200 N east, the other with a force of 175 N west. A friction force of 10 N exists between the sled and the surface. Determine the net force on the sled.
5. A heavy wagon is pulled along the sidewalk by a force of 12 N, with a 10 N force opposing the motion. The force of gravity on the wagon is 20 N.
 - a) Draw a f.b. diagram showing all the forces acting on the wagon.
 - b) Determine the net force on the wagon.
6. A 400 N force pulls due north on a crate. What other force must act on the crate if:
 - a) the net force on the crate is 386 N due south?
 - b) the net force on the crate is 152 N due north?
7. Hayley Davidson is riding her motorbike south along a flat, horizontal road. The total weight of Hayley and her hog is 1800 N. The engine exerts a 600 N force forward. The air resistance acting on Hayley and the bike is 200 N. The total friction between the tires and the road is 100 N.
 - a) Draw a f.b. diagram for the system that includes Hayley and her motorbike.
 - b) Calculate the net force on the system.
8. A textbook sitting on a table weighs 3.6 N. If you push straight down on the book with a force of 8.4 N, what is the normal force acting on the book?

1. a) 68 N b) 22 N 2. 160 N 3. 5.0×10^6 N 4. 15 N east 5 a) see below b) 2 N 6. a) 786 N south
b) 248 N south 7. a) see below b) 300 N 8. 12 N up

5 a)



7 a)

