One-Dimensional Net Force Practice

Problem #1:

What is the net force acting on a boy if the earth pulls downward on him with 400 Newtons of force (We call this force the boy's weight, or the gravitational force acting on him.) while a stair pushes upward on him with 300 Newtons of force? Let's assume no other forces are acting on the boy.

Problem #2:

What is the net force acting on a boy if the earth pulls downward on him with 400 Newtons of force while a stair pushes upward on him with 600 Newtons of force? Let's assume no other forces are acting on the boy.

Problem #3:

What is the net force acting on a tug-of-war rope if Team A pulls to the left on the rope with 1,000 Newtons of force while Team B pulls on the rope with 1,000 Newtons of force. Let's assume the two teams are pulling in opposite directions and that no other forces are acting on the rope.

Problem #4:

What is the net force acting on a tug-of-war rope if Team A pulls to the left on the rope with 1,000 Newtons of force while Team B pulls on the rope with 1,500 Newtons of force. Let's assume the two teams are pulling in opposite directions and that no other forces are acting on the rope.

Problem #5:

What is the net force acting on my desk if I push on it to the right with 700 Newtons of force while the floor pushes on it to the left with 700 Newtons of force? Let's assume no other forces are acting on the desk.

Problem #6:

What is the net force acting on my desk if I push on it to the right with 900 Newtons of force while the floor pushes on it to the left with 700 Newtons of force? Let's assume no other forces are acting on the desk.

Problem #7:

What is the net force acting on my desk if I push on it to the right with 700 Newtons of force while the floor pushes on it to the left with 800 Newtons of force? Let's assume no other forces are acting on the desk.

Problem #8:

What is the net force acting on my car when my four kids each push forward on it with 500 Newtons of force? Let's assume no other forces are acting on the car.

Problem #9:

What is the net force acting on my car when my four kids each push forward on it with 500 Newtons of force while friction pushes backward on the car with 1,200 Newtons of force? Let's assume no other forces are acting on the car.

Solutions

Problem #1:

What is the net force acting on a boy if the earth pulls downward on him with 400 Newtons of force (We call this force the boy's weight, or the gravitational force acting on him.) while a stair pushes upward on him with 300 Newtons of force? Let's assume no other forces are acting on the boy.

Solution:

When two forces act in opposite directions, we subtract the smaller force from the larger force to find the net force.

400 N – 300 N = 100 N

In addition, the direction of the net force is the same as the direction of the larger of the two forces.

The larger force pulls downward on the boy, and so the net force points downward.

The net force acting on the boy is <mark>100 N downward</mark>.

Problem #2:

What is the net force acting on a boy if the earth pulls downward on him with 400 Newtons of force while a stair pushes upward on him with 600 Newtons of force? Let's assume no other forces are acting on the boy.

Solution:

When two forces act in opposite directions, we subtract the smaller force from the larger force to find the net force.

600 N – 400 N = 200 N

In addition, the direction of the net force is the same as the direction of the larger of the two forces.

The larger force pushes upward on the boy, and so the net force points upward.

The net force acting on the boy is <mark>200 N upward</mark>.

Problem #3:

What is the net force acting on a tug-of-war rope if Team A pulls to the left on the rope with 1,000 Newtons of force while Team B pulls on the rope with 1,000 Newtons of force. Let's assume the two teams are pulling in opposite directions and that no other forces are acting on the rope.

Solution:

When two forces act in opposite directions, we subtract the smaller force from the larger force to find the net force. The two forces in this problem are the same size, and so it doesn't matter which force we write first when subtracting because we will end up with an answer of zero Newtons either way.

1,000 N – 1,000 N = 0 N

Because the net force is equal to zero, it has no direction.

The net force acting on the rope is 0 N.

Problem #4:

What is the net force acting on a tug-of-war rope if Team A pulls to the left on the rope with 1,000 Newtons of force while Team B pulls on the rope with 1,500 Newtons of force. Let's assume the two teams are pulling in opposite directions and that no other forces are acting on the rope.

Solution:

When two forces act in opposite directions, we subtract the smaller force from the larger force to find the net force.

1,500 N – 1,000 N = 500 N

In addition, the direction of the net force is the same as the direction of the larger of the two forces.

The larger force acting on the rope is to the right.

The net force acting on the rope is ==500 N to the right==.

Problem #5:

What is the net force acting on my desk if I push on it to the right with 700 Newtons of force while the floor pushes on it to the left with 700 Newtons of force? Let's assume no other forces are acting on the desk.

Solution:

When two forces act in opposite directions, we subtract the smaller force from the larger force to find the net force. The two forces in this problem are the same size, and so it doesn't matter which force we write first when subtracting because we will end up with an answer of zero Newtons either way.

700 N – 700 N = 0 N

Because the net force is equal to zero, it has no direction.

The net force acting on the desk is ==0 N==.

Problem #6:

What is the net force acting on my desk if I push on it to the right with 900 Newtons of force while the floor pushes on it to the left with 700 Newtons of force? Let's assume no other forces are acting on the desk.

Solution:

When two forces act in opposite directions, we subtract the smaller force from the larger force to find the net force.

900 N – 700 N = 200 N

In addition, the direction of the net force is the same as the direction of the larger of the two forces.

The larger force acting on the desk is to the right.

The net force acting on the desk is 200 N to the right.

Problem #7:

What is the net force acting on my desk if I push on it to the right with 700 Newtons of force while the floor pushes on it to the left with 800 Newtons of force? Let's assume no other forces are acting on the desk.

Solution:

When two forces act in opposite directions, we subtract the smaller force from the larger force to find the net force.

800 N – 700 N = 100 N

In addition, the direction of the net force is the same as the direction of the larger of the two forces.

The larger force acting on the desk is to the left.

The net force acting on the desk is 100 N to the left.

Problem #8:

What is the net force acting on my car when my four kids each push forward on it with 500 Newtons of force? Let's assume no other forces are acting on the car.

Solution:

When two forces act in the same direction, we add the forces together to find the net force.

500 N + 500 N + 500 N + 500 N = 2,000 N

In addition, the direction of the net force is the same as the direction of the forces. In this problem, the kids all push forward on the car. The direction of the net force acting on the car is forward.

The net force acting on the car is ==2,000 N forward==.

Problem #9:

What is the net force acting on my car when my four kids each push forward on it with 500 Newtons of force while friction pushes backward on the car with 1,200 Newtons of force? Let's assume no other forces are acting on the car.

Solution:

In this problem, we have four forces acting in the forward direction on the car while one force acts backward on the car. First, I will add together the four forces acting in the forward direction on the car to find the total force acting in the forward direction on the car.

500 N + 500 N + 500 N + 500 N = 2,000 N

Thus, the total force acting in the forward direction is 2,000 N.

Now, we can find the net force acting on the car by subtracting the smaller backward force from the larger total forward force (We subtract when forces point in opposite directions.).

2,000 N – 1,200 N = 800 N

The net force acting on the car points in the forward direction because the total force in the forward direction is larger than the force in the backward direction.

The net force acting on the car is 800 N forward.