

Dynamics-Newton's 3rd Law

1. A student pulls a 60-newton sled with a force having a magnitude of 20 newtons. What is the magnitude of the force that the sled exerts on the student?



1. 20 N
2. 40 N
3. 60 N
4. 80 N

2. If a 65-kilogram astronaut exerts a force with a magnitude of 50 newtons on a satellite that she is repairing, the magnitude of the force that the satellite exerts on her is

1. 0 N
2. 50 N less than her weight
3. 50 N more than her weight
4. 50 N

3. A 400-newton girl standing on a dock exerts a force of 100 newtons on a 10,000-newton sailboat as she pushes it away from the dock. How much force does the sailboat exert on the girl?

1. 25 N
2. 100 N
3. 400 N
4. 10,000 N

4. A carpenter hits a nail with a hammer. Compared to the magnitude of the force the hammer exerts on the nail, the magnitude of the force the nail exerts on the hammer during contact is



1. less
2. greater
3. the same

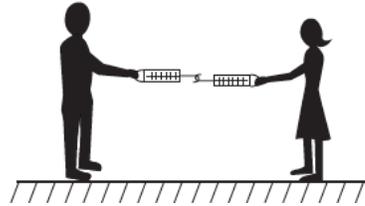
5. A woman is pushing a baby stroller. Compared to the magnitude of the force exerted on the stroller by the woman, the magnitude of the force exerted on the woman by the stroller is



1. zero
2. smaller, but greater than zero
3. larger
4. the same

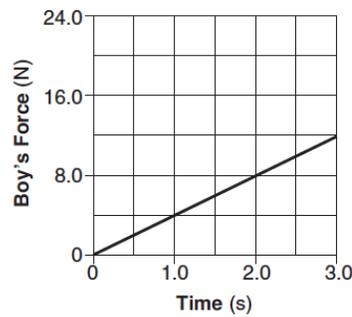
6. When a child squeezes the nozzle of a garden hose, water shoots out of the hose toward the east. What is the compass direction of the force being exerted on the child by the nozzle?

7. A 100-kg boy and a 50-kg girl, each holding a spring scale, pull against each other as shown in the diagram below.



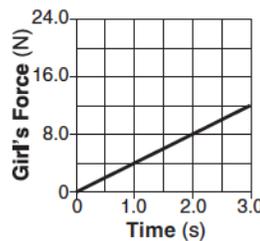
The graph below shows the relationship between the magnitude of the force that the boy applies on his spring scale and time.

Boy's Force vs. Time

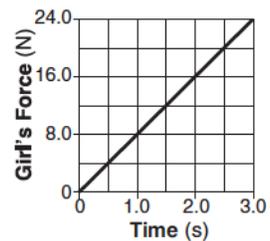


Which graph best represents the relationship between the magnitude of the force that the girl applies on her spring scale and time?

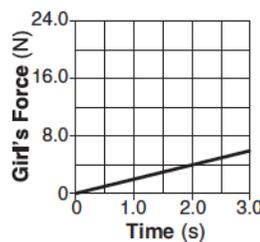
Girl's Force vs. Time



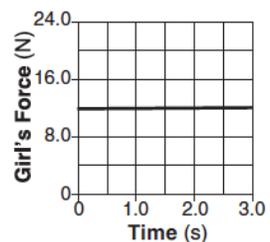
Girl's Force vs. Time



Girl's Force vs. Time

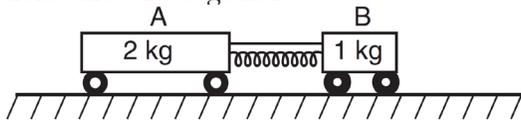


Girl's Force vs. Time



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8. The diagram below shows a compressed spring between two carts initially at rest on a horizontal, frictionless surface. Cart A has a mass of 2 kilograms and cart B has a mass of 1 kilogram. A string holds the carts together.



The string is cut and the carts move apart. Compared to the magnitude of the force the spring exerts on cart A, the magnitude of the force the spring exerts on cart B is

1. the same
 2. half as great
 3. twice as great
 4. four times as great
9. A baseball bat exerts a force of magnitude F on a ball. If the mass of the bat is three times the mass of the ball, the magnitude of the force of the ball on the bat is
1. F
 2. $2F$
 3. $3F$
 4. $F/3$
10. As a 5.0×10^2 -newton basketball player jumps from the floor up toward the basket, the magnitude of the force of her feet on the floor is 1.0×10^3 newtons. As she jumps, the magnitude of the force of the floor on her feet is
1. 25 N
 2. 100 N
 3. 500 N
 4. 1,000 N