Impulse WS 2

True or False

1. When two objects collide, the magnitude of the impulse on each object is the same. T or F
2. The forces exerted on two objects when they collide are equal in magnitude. T or F
3. N*s and Kg*m/s are interchangeable units for impulse. T or F
4. The change in momentum is not equal to impulse for an object. T or F
5. Impulse and momentum cannot be expressed in the same units. T or F

Fill in the Blank

6. If the velocity of an object triples, the momentum of the object _____.
7. If the mass of an object doubles, the momentum of the object _____.

Impulse Word Problems

8. A .03 kg bullet is fired from a rifle at rest by an unbalanced force of 300 N. If the force acts on the bullet for .2 seconds, what is the maximum velocity magnitude obtained by the bullet?
9. What is the velocity magnitude of a 3 kg object after starting from rest and being acted upon by an impulse of 300 N*s?
10. A .04 kg bullet is fired from a 5 kg rifle initially at rest. If the bullet leaves the rifle with a velocity of 350 m/s, what is the impulse magnitude on the rifle?
11. A 25 kg rocket's engine delivers a total impulse of 500 N*s in .1 seconds. What was the average net force on the rocket?
12. A 75 kg woman threw a 1 kg from rest to a velocity of 15 m/s in .3 seconds. What was the impulse magnitude that the woman delivered to the ball?
13. A baseball catcher is able to catch a .145 kg ball in his glove within .1 seconds. If the ball was initially traveling at 45 m/s, what was the average net force magnitude of the glove on the ball?
14. A baseball catcher is able to catch a .145 kg ball in his glove within .1 seconds. If the ball was initially traveling at 45 m/s, what was the average net force magnitude of the ball on the glove?

Thinking Question

15. Why do catchers move their glove backward as they catch a pitcher's fast ball?
    a. Bringing the glove back increases the contact time and therefore decreases the average net force on the ball by the catcher's glove.
    b. Bring the glove back decreases the change in momentum of the ball, therefore decreasing the average net force on the ball by the catcher's glove.
    c. Bringing the glove back decreases the impulse on the ball, therefore decreasing the average net force on the ball by the catcher's glove.
    d. Bringing the glove back decreases the change in momentum of the ball, therefore decreasing the average net force on the ball by the catcher's glove.
    e. Bringing the glove back does nothing to change the average net force, impulse, time, or change in momentum.
    f. Bringing the glove back decreases the contact time and therefore increases the average net force on the ball by the catcher's glove.