

Name: _____ Date: _____

m_r^β **Physics Practice: Newton's Laws of Motion**

For each law of motion, write the law. Then draw a mnemonic, like a very simple picture, text, or formula to help you remember the law.

1. First Law of Motion:

2. Second Law of Motion:

3. Third Law of Motion:

Answer the remaining problems, and explain your answer. Your explanation may involve the three laws, or the definitions of velocity and acceleration.

4. If an object is moving, does that mean there is a net external force on the object?

5. An object is accelerating. Is there necessarily an external force on the object?

6. An object is accelerating to the east. What is the direction of the external force?

7. An object is decelerating to the east. What is the direction of the external force?

8. Mr. Benson tries to lift up his coffee cup. By Newton's third law, the coffee cup exerts an exactly equal but opposite force on Mr. Benson. If this is true, why is Mr. Benson able to lift his coffee cup?

9. A rocket in space fires its engine, and begins to accelerate. By Newton's second law, acceleration is inversely proportional to the mass. As the rocket accelerates, it expends fuel, and so loses mass. What is happening to the acceleration of the rocket?

10. Mrs. Krause steps on the brake in her car. The car decelerates. Why does that mean there must be an external force slowing the car? What is the source of that external force, and what direction is it relative to the motion of the car?

11. Is it possible to drive around a curve at constant velocity?

12. Is it possible to drive around a curve with zero acceleration?

13. Is it possible to drive around a curve with constant acceleration?
