Name: _____   Period: _____

IPS Unit 4 - Forces Review

Directions: *In the blank at the left, write the letter of the term that correctly completes each statement.*

_____ 1. Forces that are _____ result in a net force of zero.

       A. balanced   B. unbalanced

_____ 2. Any push or a pull that can change and objects motion is_____.

       A. a force   B. inertia

_____ 3. The amount of gravitational force between two objects depends on its _____.

       A. color and intensity   B. mass and distance

_____ 4. Weight is measured in units called_____.

       A. Newtons   B. kilograms

_____ 5. Mass is measured in units called_____.

       A. kilonewtons   B. kilograms

Directions: *Fill in the blanks using the terms listed below. Use each term only once.*

Parabolic	**Reaction**	**Net unbalanced**	**Inertia**
	Acceleration	**Opposite**	

Newton's First Law

6.   Defined as: an object at rest will remain at rest unless acted upon by a _____ force.

7.   _____ is the tendency of an object to resist any change in its motion.

Newton's Second Law

8.   Defined as: net force acting on an object causes the object to accelerate in the direction of the net force, F = mass x _____.

9.   An object that is shot or thrown follows a _____ path because of the force of gravity pulling it.

Newton's Third Law

10. Defined as: to every action there is an equal and _____ reaction force.

11. The backward "kick" of a rifle that is fired is an example of a(n)_____ force.

Directions: *Complete the paragraphs by using the words listed below to fill in the blanks. Use each term only once.*

9.8 m/s²   **accelerate**   **air resistance**   **same**   **continues**   **fall**

decelerate   **freefall**   **equals**   **gravity**   **laws of motion**   **velocity**

straight line   **weightlessness**   **satellites**

Newton's (12)_____ can be used to explain events in the natural world, such as

how a pencil falls to the floor and how planets revolve around the Sun. In the absence of air resistance, all

objects fall at the (13)_____ rate, because the force of Earth's gravity causes objects to

(14)_____ by (15)_____. (16)_____ can eventually

counteract the acceleration from (17)_____. This is why a flat piece of paper falls

slowly, but when the same piece of paper is crumpled, it falls quickly. When the upward force of air

resistance on an object (18)_____ the downward force of gravity on the object, its

(19)_____ stops increasing.

(20)_____ orbit Earth because of gravity. They travel very fast, but with each meter

forward that they travel, they (21)_____ just a tiny bit due to Earth's gravity. Astronauts in

Earth's orbit experience (22)_____ because they are in (23)_____.

Without gravity, satellites would continue in a (24)_____ away from Earth.

Newton's laws also describe what happens in collisions. For example, in a moving car, a passenger is also

in motion. When the car comes to a sudden stop, the passenger (25)_____ in motion. To

protect the passenger from striking inside of the car, seatbelts and airbags (26)_____

passengers slowly.

Directions: *Determine whether each underlined term makes each statement true or false. If the statement is true, write the word "true" in the blank. If false, write the correct term to make the statement true in the blank.*

_____ 27. Objects fall towards Earth at a rate of 9.8 m/s² because of <u>centripetal force.</u>

_____ 28. F =ma represents Newton's <u>second</u> law of motion.

_____ 29. The <u>net force</u> on an object is the combination of all the forces acting on the object.

_____ 30. The force of gravity acting on an object is the object's <u>mass.</u>

_____ 31. <u>Friction</u> is the force that opposes motion between surfaces that touch each other.

_____ 32. To every action force there is an equal and opposite reaction force in the <u>law of conservation of momentum.</u>

_____ 33. <u>Field</u> is the tendency of an object to resist change in motion.

_____ 34. Air resistance acts in <u>opposite</u> direction to that of an object in motion.

Directions: *Do the following calculations. Show your work in the spaces provided.*

35. What is the force of an object with a mass of 12kg and an acceleration of 4m/s²?

36. Calculate the acceleration of a 25kg object that is moved with a force of 300N.

37. What is the mass of an object that is accelerating at 15m/s² when a force of 3000N is exerted?

Directions: *Draw the resultant vector using the parallelogram method or tip-to-tail method of vector addition. Label the resultant as vector R.*
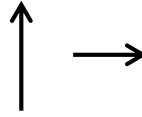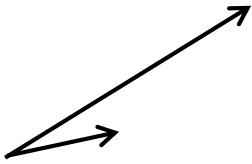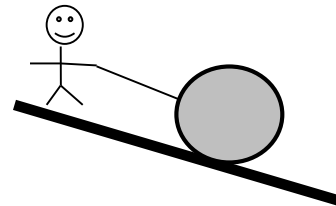
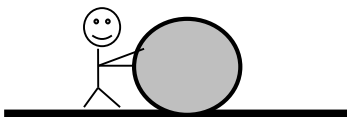**Directions:** *Draw and label force vectors for each diagram.*

A ball sliding down a ramp.
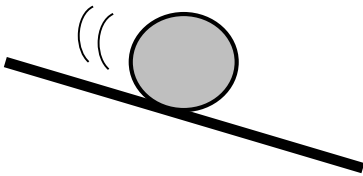
A ball is tied to a rope and pulled at a constant speed.

A ball on the ground is being pushed but is not moving.

A ball is hanging from strings.