Newton's Third Law Markscheme

1. State Newton's Third Law.

Every action has an equal and opposite reaction (If object A exerts a force on object B, object B will exert an equal and opposite force on object A).

2. For each of the scenarios identify the action-reaction pairs.

a. A rocket taking off

- **The force of the rocket on the ground (thrust of the engine)**
- **The force of the ground on the rocket**

b. A man swimming freestyle

- **Man pushing the water backwards**
- **Water pushing the man forwards**

c. The Moon orbiting the Earth

- **Pull of gravity of Earth on the Moon**
- **Pull of gravity of Moon on the Earth**

d. A person leaning against a wall

- **Force of person pushing against wall (not weight because weight acts downwards)**
- **Reaction force of wall pushing against person**

3. Explain why a gun recoils when a bullet is shot out of it.

The gun and the bullet exert equal and opposite forces on each other so when the bullet is pushed forward it pushes the gun backwards.

It does not accelerate as quickly as the bullet because it has a much greater mass.

4. Describe what would happen if a person jumps off a boat and explain why this would happen.

The person would jump forward off the boat causing the boat to be pushed backwards. This is because the person and the boat exert equal and opposite forces on each other.