Questions Related to Acceleration of Gravity

1. The term "kinematics" comes from the Greek language. How would this term be expressed in English?
   □ the study of how a film reel is turned at the cinema
   ■ the study of the motion of points and bodies in space
   □ the study of everything outside of mathematics

2. What does the term "freefall" refer to?
   □ fruit that has fallen off a tree and does not need to be paid for
   □ a theft that has gone unnoticed thus far
   ■ the motion of an object where gravity is the only external force acting on it

3. What equations are relevant to the analysis of freefall?
   ■ time-distance equation
   ■ rate-time equation
   ■ acceleration-time law

4. What is the name of the unit in which acceleration is measured?
   ■ m/s²
   □ joule
   □ newton
   □ m/s

5. What is the freefall acceleration on Earth (standard acceleration) expressed in the unit referred to in question 4?
   ■ 9.81
   □ 1.89
   □ 8.91
   □ 3.33

6. The hippopotamus falls at exactly the same rate as an earthworm in a vacuum!
   □ This statement is not true.
   □ This statement does not hold true on the moon.
   ■ This statement is correct, because freefall acceleration is independent of mass.
   □ The statement is true. Although the hippopotamus is more strongly attracted, it is also heavier, meaning that more mass needs to be moved.

7. Is the accuracy of our measured result impacted adversely or positively by doubling the drop height in our experiment, or does it not matter?
   ■ It is impacted positively
   □ does not matter
   □ adversely
   Explanation: The longer the falling distance and fall time, the more accurately the measured results can be calculated. Any timing errors will be a smaller percentage of the total measured time for bigger drop heights.
8. What did Felix Baumgartner achieve on October 14, 2012?
- supersonic speed
- a jump from a height of 36.5 km
- 5.2 seconds of zero gravity

9. Where can knowledge about freefall come in handy?
- in aviation and aerospace, to simulate zero-gravity conditions in parabolic flights
- in the design of new cars (reducing aerodynamic resistance), to economize on fuel
- in the design of ski jumps and ski-jump landing strips