



4.10. Certainly, that is possible. Lift a body and release it carefully, so that no initial velocity is imparted to it. Here the direction of motion will coincide with the direction of the force of gravity. If, however, you impart a horizontal initial velocity to the body then its direction of motion will not coincide with the direction of the gravity force; the body will follow a parabolic path. Though in both cases the body moves due to the action of the same force : its weight, the nature of its motion differs. A physicist would say that this difference is due to the different initial conditions : at the beginning of the motion the body had no velocity in the first case and a definite horizontal velocity in the second.

Illustrated in Fig. 4.2 are the trajectories of bodies thrown with initial velocities of different directions, but in all cases the same force, the weight of the body, is acting on it. ◇

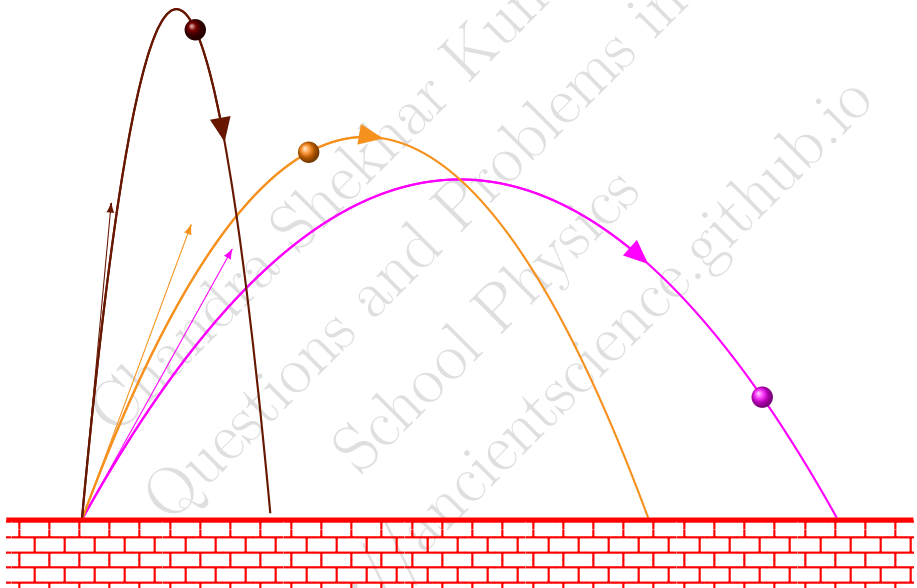


Figure 4.2: Projectiles with different initial velocities



. Does that mean that the nature of the motion of a body at a given instant depends not only on the forces acting on the body at this instant, but also on the initial conditions ? ■



4.11. Exactly. It should be emphasized that the initial conditions reflect the prehistory of the body. They are the result of forces that existed in the past. These forces no longer exist, but the result of their action is manifested. From the philosophical point of view, this demonstrates the relation of the past to the present, i.e, the principle of causality.