6. Running on ice

1) During the process, the velocity vector needs to change its direction by 90 degrees. Let us consider the this graphically using the $v_x - v_y$-plane: we need to move from the point A with coordinates $(0, v)$ to a point B with coordinates $(v, 0)$ while having a constant "speed". Indeed, the velocity of a point in the $v_x - v_y$-plane is the acceleration of the body, which has here a constant modulus μg. Obviously, the fastest path is a straight line of length $v\sqrt{2}$, so that $t = v\sqrt{2}/\mu g \approx 7.2\,\mathrm{s}$.

2) Since the direction of the acceleration is constant, the trajectory is the same as for a body in the Earth's field of gravity — a parabola.