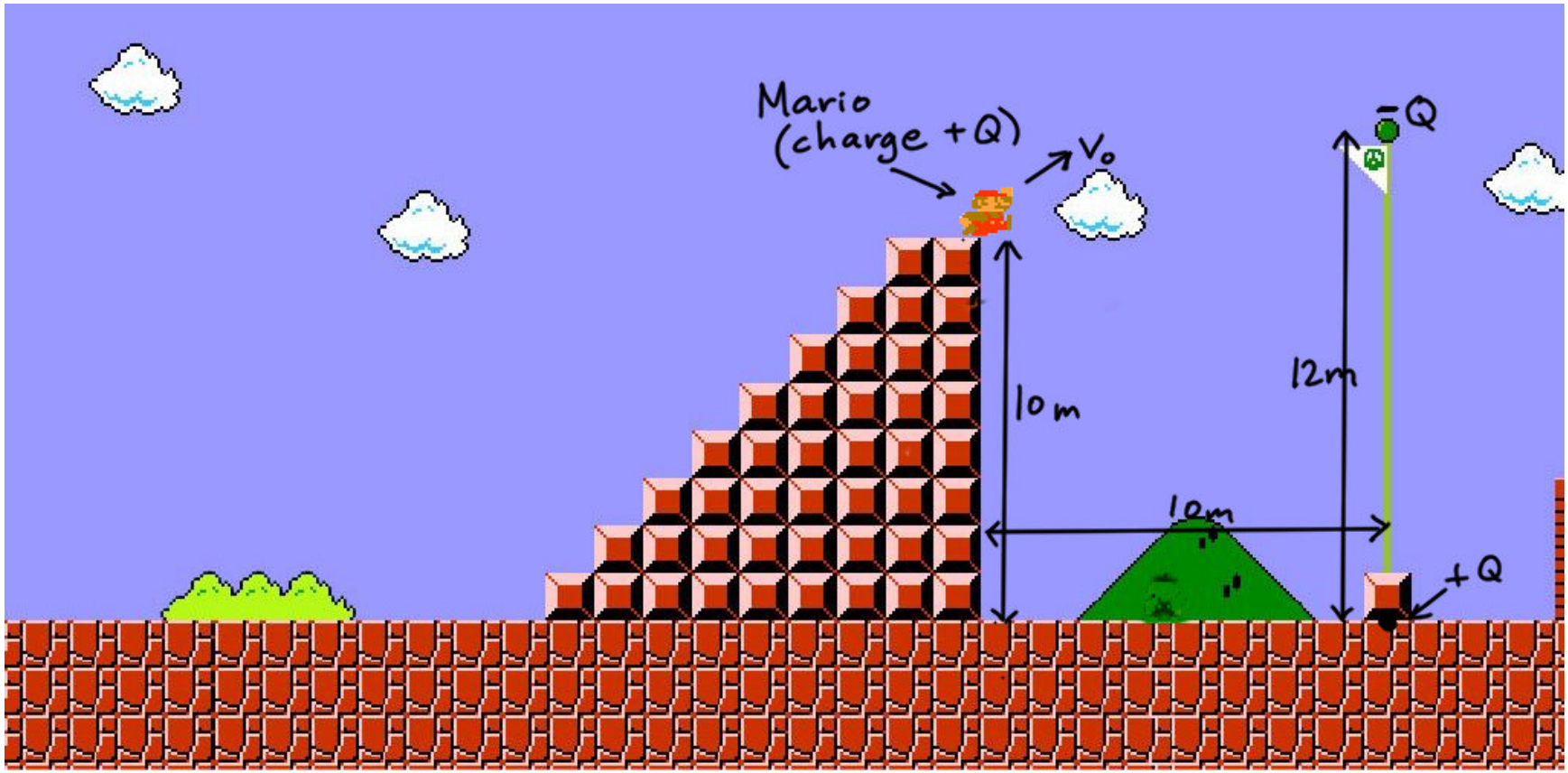

Mario is nearing the end of level 1-1. To complete the level, he must reach the flagpole. He gets bonus points depending on how high up he touches the pole, with 5000 points for reaching the top (12m) and proportionately less points for touching lower down. Having recently collected a Charge+ mushroom, Mario (mass 10kg) is carrying a positive charge of Q = 0.4mC. To reach the flagpole, Mario jumps with speed v_0 = 8m/s at a 45 degree angle as shown in the picture. If there are -Q and +Q charges at the bottom and top of the flagpole as shown, and g is exactly 10m/s^2 in Mario's world, how many bonus points does Mario get? Also, how long is Mario in the air before hiting the pole?

Hint: you may need to use Python or Excel for this. You can treat Mario as a point particle that starts 10m above the ground. As a warm-up, you may want to calculate the electric field at Mario's initial location.