Consider three blocks of equal mass $m$ sliding along frictionless tracks. Track 2 is strictly horizontal. Track 1 leads over a hill and track 3 through a valley. The blocks are simultaneously launched with equal initial velocity $v_0$ at the positions shown. The curvatures in tracks 1 and 3 are sufficiently gentle for the blocks not to lift off. In what sequence do the blocks arrive at the end of their tracks? Justify your answers carefully.

Solution: