Question 35167

Let the coordinate system be placed at the position of the second cyclist. Then, coordinate of the leader of the race is $x_1(t) = 12 + v_1 t = 12 + 11.5\,t$. Since second cyclist is moving with acceleration $a = 1.2\,\dfrac{m}{s^2}$, the coordinate of the second bicyclist is $x_2(t) = v_2^0 t + \dfrac{a\,t^2}{2} = 9.10\,t + \dfrac{1.2 \cdot t^2}{2}$. When second cyclist catches the leader, $x_1(t) = x_2(t)$, which yields simple quadratic equation $9.10\,t + 0.6 t^2 = 12 + 11.5\,t$. Solutions of the latter one are $t_1 = 6.9\,s\,; t_2 = -2.89\,s$. Since time is positive, the second cyclist will reach the leader in 6.9 seconds.