

32. The initial velocity has no vertical component – only an x component equal to $+2.00$ m/s. Also, $y_0 = +10.0$ m if the water surface is established as $y = 0$.

(a) $x - x_0 = v_x t$ readily yields $x - x_0 = 1.60$ m.

(b) Using $y - y_0 = v_{0y}t - \frac{1}{2}gt^2$, we obtain $y = 6.86$ m when $t = 0.800$ s.

(c) With t unknown and $y = 0$, the equation $y - y_0 = v_{0y}t - \frac{1}{2}gt^2$ leads to $t = \sqrt{2(10)/9.8} = 1.43$ s. During this time, the x -displacement of the diver is $x - x_0 = (2.00 \text{ m/s})(1.43 \text{ s}) = 2.86$ m.