

1. Assuming the horizontal velocity of the ball is constant, the horizontal displacement is

$$\Delta x = v\Delta t$$

where  $\Delta x$  is the horizontal distance traveled,  $\Delta t$  is the time, and  $v$  is the (horizontal) velocity. Converting  $v$  to meters per second, we have  $160 \text{ km/h} = 44.4 \text{ m/s}$ . Thus

$$\Delta t = \frac{\Delta x}{v} = \frac{18.4 \text{ m}}{44.4 \text{ m/s}} = 0.414 \text{ s}.$$

The velocity-unit conversion implemented above can be figured “from basics” ( $1000 \text{ m} = 1 \text{ km}$ ,  $3600 \text{ s} = 1 \text{ h}$ ) or found in Appendix D.