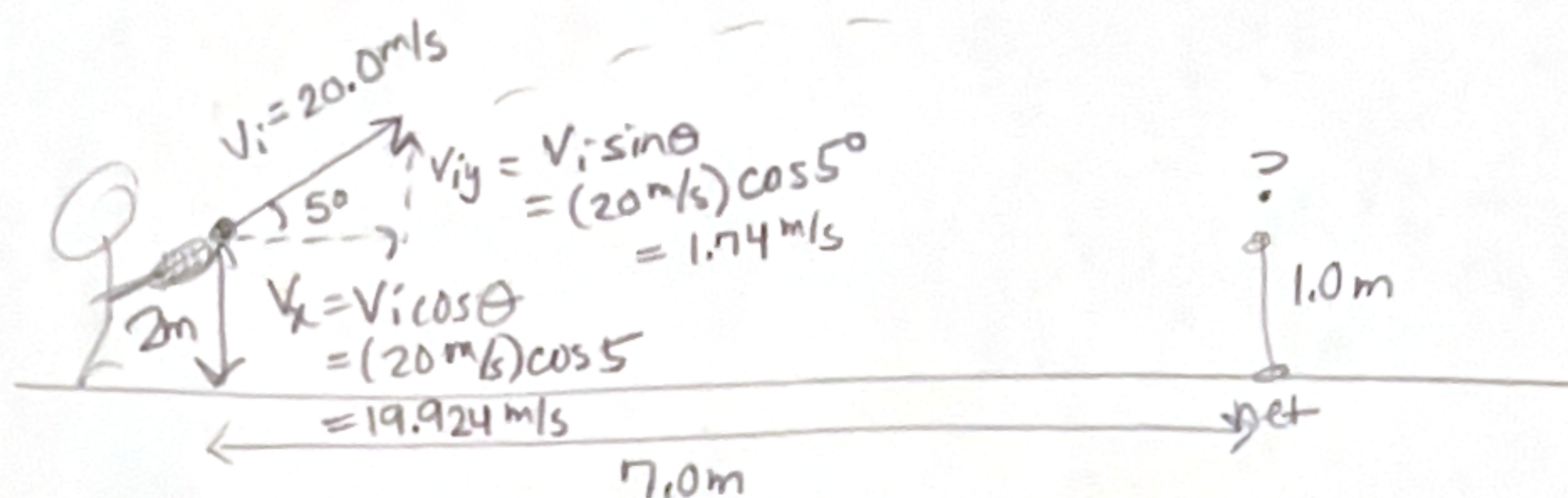


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Does the ball clear the net?

If I find the ball's height at  $x = 7.0 \text{ m}$ , where the net is, I can tell if it clears the net.

Time interval: from  $t=0$  to the <sup>x-position</sup> ~~location~~ of the net

<u>HORIZ</u>	<u>VERT</u>
$\Delta x = 7.0 \text{ m}$	$\Delta y = ?$
$v_x = 19.924 \text{ m/s}$	$v_{iy} = 1.74 \text{ m/s}$
$\Delta t =$	$v_{fy} =$
	$a_y = -9.8 \text{ m/s}^2$
	$\Delta t =$

I see I can find  $\Delta t$  from the horizontal variables.

$$\begin{aligned}\Delta x &= v_x \Delta t \\ 7.0 \text{ m} &= (19.924 \text{ m/s}) \Delta t \\ 0.35 \text{ s} &= \Delta t\end{aligned}$$

Now I can find the height ( $\Delta y$ ) at this time:

$$\begin{aligned}\Delta y &= v_{iy} \Delta t + \frac{1}{2} a_y \Delta t^2 \\ &= (1.74 \text{ m/s})(0.35 \text{ s}) + \frac{1}{2} (-9.8 \text{ m/s}^2)(0.35 \text{ s})^2 \\ &= .61074 - .6036849 \\ &= 0.007 \text{ m}\end{aligned}$$

The initial height of the ball above ground was 2.0m, so when it gets to the net, its height is 0.007m more, so  $H = 2.007 \text{ m}$ . The net is 1m high, so it clears the net by  $2.007 \text{ m} - 1 \text{ m} = \boxed{1.007 \text{ m}} \approx \boxed{1.0 \text{ m}}$