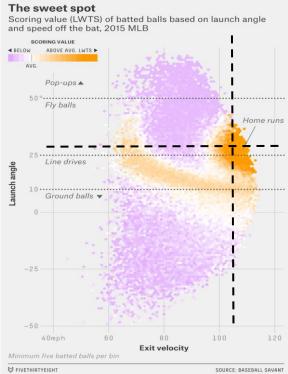
Baseball's Upward Trend Is Leaving Some Players Grounded

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The new conventional wisdom in baseball is that (((**hitters are more effective when they adjust their swings to increase the launch angle of the ball when it leaves the bat.**))) Doing so produces more fly balls that can turn into doubles, triples and home runs. Many players, including Josh Donaldson and Yonder Alonso, attribute their success to this new trend. Nevertheless, this tactic doesn't work for every player. Reyes hits a relatively high percentage of his batted balls between 20 and 80 degrees, resulting in fly balls and pop ups. However, almost all of his base hits come on balls that he hits between 0 and 20 degrees. The distribution of Reyes's batted-ball launch angles resembles that of the Detroit slugger J.D. Martinez.

The sweet spot
Scoring value (LWTS) of batted balls based on launch angle and speed off the bat, 2015 MLB

FIVETHIRTYEIGHT SOURCE: BASEBALL SAVANT

INTRODUCTION: By the chart at left it can be seen home runs are achieved when hit on average at 27° at 105 mph.(v).

QUESTIONS: (a) Convert 105 mph to ft./s. ? , (b) Find v cos 27° in ft./s.?, (c) Find v sin. 27°?, (d) Break solution into Horizontal and vertical parts and find time of flight and horizontal distance (x) traveled by the ball? Assume ball lands at the same height it is hit. Assume also ball is moving in a vacuum.

HINTS: 88 ft./s. = 60 mph , Assume horizontal component of velocity is constant. Vertical component of v behaves as a freely falling object. $X = v_H t$, $Y = V_{OV} t + \frac{1}{2} g t^2$

ANSWERS: (a) v = 154 ft./s.
(b) v cos. 27° = 137.22 ft./s.
(c) v sin. 27° = 69.916 ft./s.
(d) t = 4.37 s. , x = ~ 600 ft.

COMMENT: Due to air friction ball would go a shorter distance X.