

PROJECTILES

Unit 9 + kinematics Dr. John P. Cise , Professor of Physics,

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Stephen Curry Says He Can Get Better, and 29 Teams Shudder



$$\theta = 45^\circ$$

$$X = 22 \text{ ft.}$$

$$Y = 2 \text{ feet}$$



INTRODUCTION: Three main concepts about projectiles are: $V_{\text{HORIZONTAL}} = \text{constant}$, $t_H = t_V$ V_{VERTICAL} behaves as any free falling object.

QUESTIONS: Sketch at least six positions in the flight of the basketball the horizontal and vertical components of velocity? (b) Find initial velocity and time of flight? (c) Convert V to mph?

Stephen Curry shooting a 3-pointer against the Pelicans on Monday. Curry, whose post-practice routine involves taking 100 3-point shots, is 46 percent from beyond the arc this season for the 61-6 Warriors

OAKLAND, Calif. — Stephen Curry has a **well-established after-practice routine of taking 100 shots from 3-point range. He works his way around the arc, hoisting 10 shots from each spot. He once made 70 in a row.** He often looks annoyed if the ball so much as glances off the rim before falling through. Deep into his record-setting season with the Warriors, Curry, 28, seems determined to [push the outer bounds of basketball](#) and to press himself, as always, to become a better player. This raises an interesting question: Is there actually that much room for improvement? Some of his teammates are skeptical. "I mean, there isn't a whole lot," Andrew Bogut said. "What's next? I guess shooting pull-ups from halfcourt on a more consistent basis." So, yes, on the surface, it sounds like an absurd question. Absurd because Curry, who led the Warriors to a [121-85 win](#) over the Knicks on Wednesday, **(((has made 330 3-pointers this season, obliterating the N.B.A. record of 286 that he set last season)))**. Absurd because he is [averaging](#) a career-best 30.5 points along with 6.4 assists a game. Absurd because he is shooting 51 percent from the field and 46 percent from 3-point range. Absurd because he is the league's reigning most valuable player and a shoo-in to win the award again. But the question is absurd mostly because Curry, a 6-foot-3-inch, 185-pound point guard, is the [guiding force](#) behind the Warriors, who could be the most dominant team of all time.

HINTS: Best if you break solution into horizontal and vertical parts since no acceleration exists in horizontal direction. $X = V_H t$, $Y = V_{OV} t + \frac{1}{2} a t^2$, $a = g = -32 \text{ ft./s.}^2$, $60 \text{ mph} = 88 \text{ ft./s.}$

ANSWERS: (a) Sketch components on graphic above. (b) $t = 1.118 \text{ s.}$, $V = 27.83 \text{ ft./s.}$ (c) $\sim 19 \text{ mph}$

X CREDIT: (d) Find vertical velocity as ball goes through hoop? (e) Find horizontal component of velocity as ball goes through hoop? (f) Find resultant velocity (magnitude and direction) as ball goes through hoop?

ANSWERS: (d) -16.1 ft./s. , (e) 19.68 ft./s. , (f) $\sim 25.42 \text{ ft./s.}$ @ 39.2° below X axis