

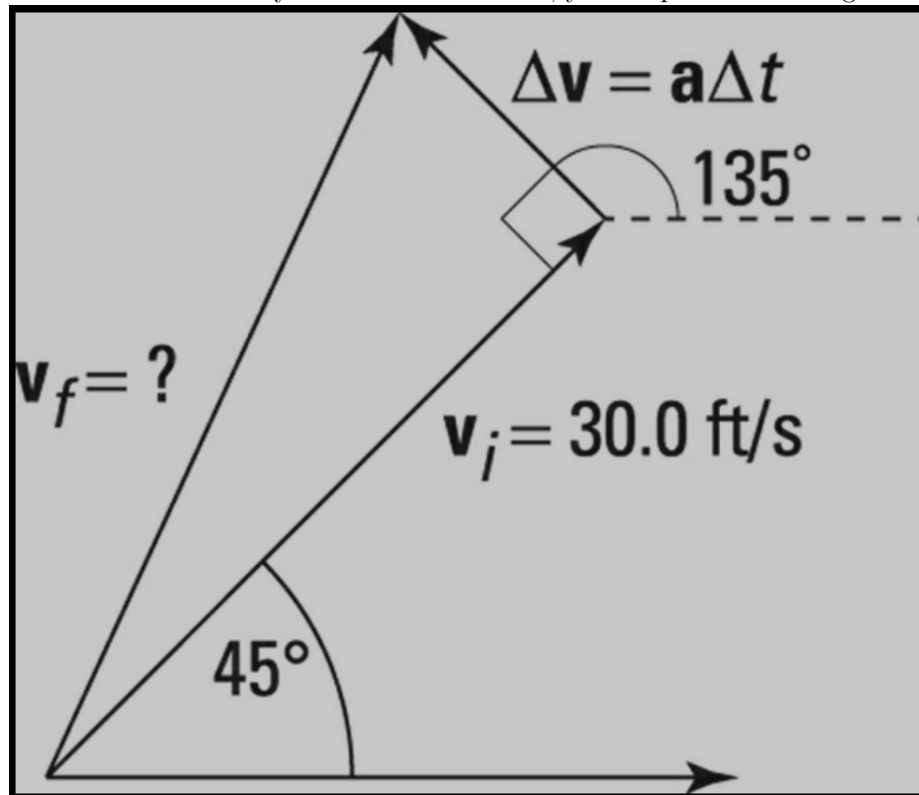
Dodging

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July 9, 2018

1 Problem

Assume that you've just managed to hit a groundball in a softball game and you're running to first base. You figure you need the y component of your velocity to be at least 25.0 feet/second and that you can swerve at 90° to your present path with an acceleration of 60.0 feet/second² in an attempt to dodge the first baseman. Is that acceleration going to be enough to change your velocity to what you need it to be in the tenth of a second that you have before the first baseman touches you with the ball? Sure, you're up to the challenge!



Holzner, Steven. Physics I For Dummies (For Dummies (Math & Science))
(p. 68). Wiley. Kindle Edition.

2 Solution

$$v = 30ft/s$$

$$\cos(45) = \frac{x}{30}$$

$$\sin(45) = \frac{x}{30}$$

$$x = 21.2ft/s \quad y = 21.2ft/s$$

$$\frac{v_f - (21.2ft/s, 21.2ft/s)}{.1s^2} = (\cos(135) * 60ft/s^2, \sin(135) * 60ft/s^2)$$

$$v_f - (21.2ft/s, 21.2ft/s) = (-4.242ft, 4.24ft)$$

$$v_f = (17.0ft/s, 25.4ft/s)$$