

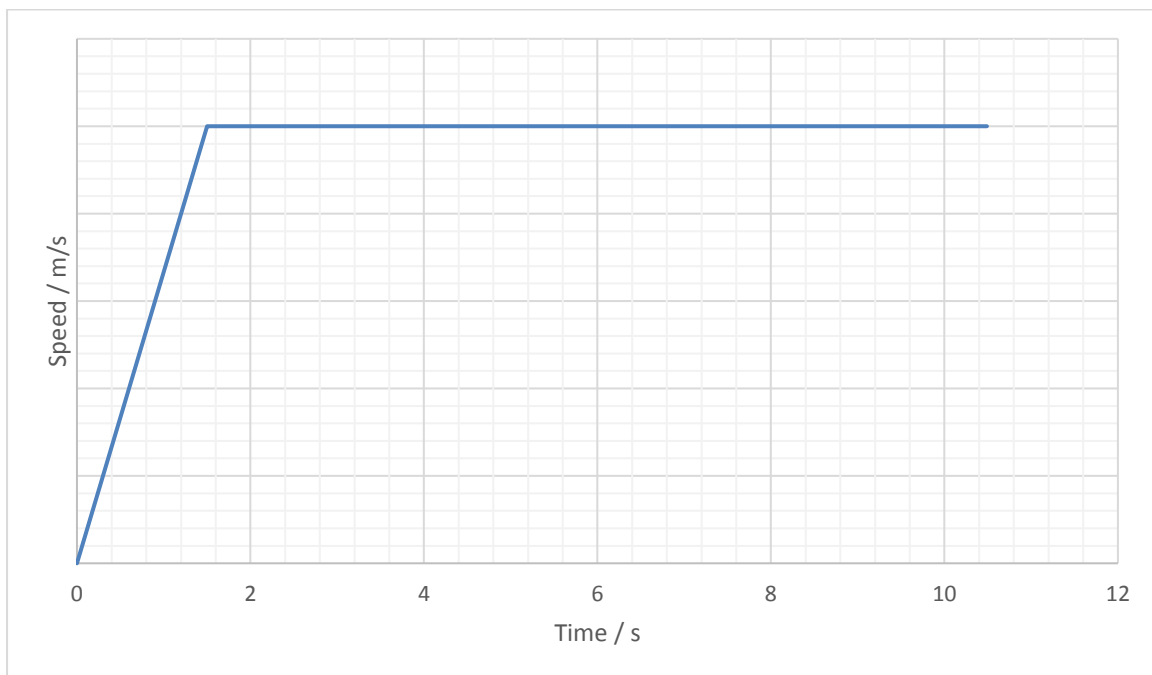
Question #78608, Physics / Other

the world record for the women's 100m sprint in 1993 stood at 10.49 s.

a) what average speed does this represent?

$$v = \frac{d}{t} = \frac{100}{10.49} = 9.53 \text{ m/s}$$

b) if the athlete accelerates to a steady speed in the first 1.5 s of the race and then runs at this speed until reaching the finishing line, at what steady speed does she run? (hint: solve by drawing the velocity time graph)



Let x represent the steady speed.

The distance is calculated as follows.

$$d = \frac{1}{2} \times 1.5 \times x + (10.49 - 1.5)x = 9.74x = 100$$

Solving for x , obtaining $x = 10.27 \text{ m/s}$

Answer: a. 9.53 m/s; b. 10.27 m/s.

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