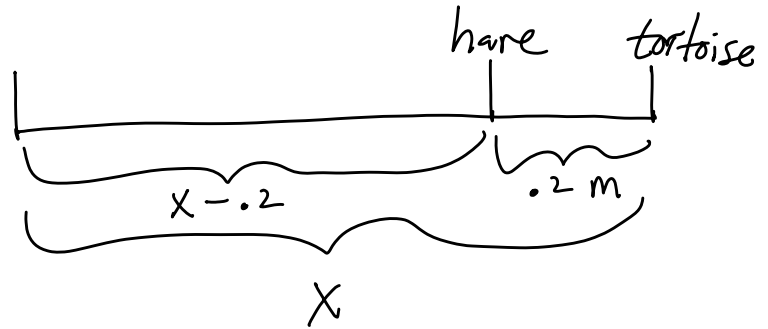


A tortoise can run with a speed of .16 m/s, and a hare can run exactly 15 times as fast. In a race, they both start at the same time, but the hare stops to rest for 2.00 min. If the tortoise wins by 20 cm,

- a. How long does the race take? Give your answer in seconds, you should get an answer between 100 – 150 seconds.

Jillian's Method



Velocity of tortoise = .16 m/s

$$V = \frac{\Delta X}{\Delta t}$$

$$.16 = \frac{X}{T}$$

Set X 's equal

$$X = .16T$$

$$X = .16T$$

Velocity of hare = 2.4 m/s

$$V = \frac{\Delta X}{\Delta t}$$

$$2.4 = \frac{X - .2}{T - 120}$$

at end of race,
hare has gone .2m
less than tortoise

at end of race,
hare has ran for
120 seconds less than
tortoise has run

$$X - .2 = 2.4(T - 120)$$

$$X - .2 = 2.4T - 288$$

$$X = 2.4T - 278.2$$

$$.16T = 2.4T - 278.2$$

Solve for T

$$2.24T = 278.2$$

$$T = 128.4 \text{ s}$$