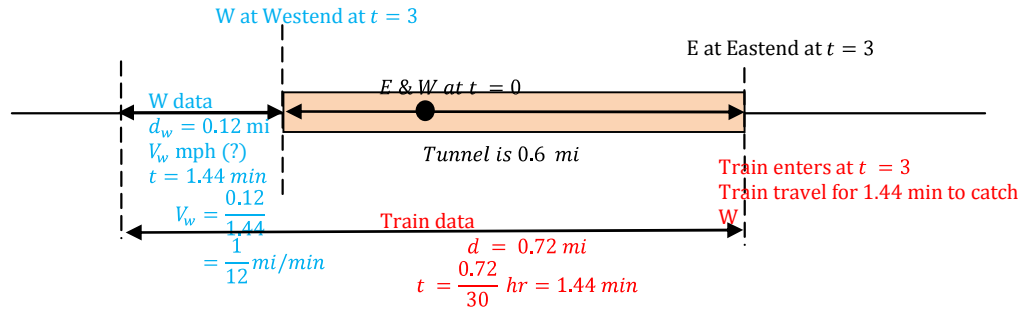


## Q 2. Train Word Problem

### Solution



Given  $v_t = 30 \text{ mph} = 0.5 \left( \frac{\text{mi}}{\text{Min}} \right)$

Tunnel length = 0.6 mi

Let

$$v_w = \text{Velocity of W} \left( \frac{\text{mi}}{\text{Min}} \right)$$

$$v_e = \text{Velocity of E} \left( \frac{\text{mi}}{\text{Min}} \right)$$

Since they both travel in opposite directions for 3 min a distance of 0.6 mi, their effective velocity is  $(v_w + v_e)$

Hence

$$3(v_w + v_e) = 0.6 \Rightarrow v_w + v_e = 0.2$$

(1)

$$\text{Train takes} \left( \frac{(0.6 + 0.12)\text{mi}}{0.5 \left( \frac{\text{mi}}{\text{Min}} \right)} \right) = 1.44 \text{ minutes to catch W}$$

$\Rightarrow$  W covers 0.12 miles in 1.44 min

$$\Rightarrow v_w = \frac{0.12}{1.44} \left( \frac{\text{mi}}{\text{min}} \right) = \frac{1}{12} \left( \frac{\text{mi}}{\text{min}} \right) = \boxed{5 \text{ mph}} \quad (2)$$

**Answer-1**

$$\Rightarrow \text{From (1) \& (2) } v_e = 0.2 - \frac{1}{12} = \frac{7}{60} \left( \frac{\text{mi}}{\text{min}} \right) = \boxed{7 \text{ mph}}$$

$\Rightarrow$  E walks with velocity of 7 mph

**Answer-2**