

Answer on Question #42627 – Physics - Mechanics | Kinematics | Dynamics

a train passes an electric post in 10 second and a bridge of length 2 km in 110 seconds. the speed of the engine is?

Solution:

$d = 2000\text{m}$ – length of the bridge;

L – length of the train;

v – speed of the train;

$t_1 = 10\text{s}$; $t_2 = 110\text{s}$;

Train passes an electric post in time t_1 :

$$\frac{L}{v} = t_1 \Rightarrow L = vt_1 \quad (1)$$

Train passes a bridge in time t_2 :

$$\frac{L + d}{v} = t_2 \quad (2)$$

(1)in(2):

$$\frac{vt_1 + d}{v} = t_2$$

$$vt_1 + d = vt_2$$

$$v = \frac{d}{t_2 - t_1} = \frac{2000 \text{ m}}{110\text{s} - 10\text{s}} = 20 \frac{\text{m}}{\text{s}} = 72 \frac{\text{km}}{\text{h}}$$

Answer: speed of the engine is $72 \frac{\text{km}}{\text{h}}$.