

A subway train starting from rest leaves a station with a constant acceleration. At the end of 7.25 s, it is moving at 17.3275 m/s.

What is the train's displacement in the first 5.162 s of motion?

Answer in units of m

Solution:

Let:

$$v = 17.3275 \text{ m/s}$$

$$t(1) = 7.25 \text{ s}$$

$$t(2) = 5.162 \text{ s}$$

$$S = ?$$

$$S = \frac{1}{2}at(2)^2, \text{ where } a \text{ - acceleration of the train.}$$

Such as $v = at(1)$

$$a = \frac{v}{t(1)}$$

$$S = \frac{1}{2} \frac{v}{t(1)} t(2)^2$$

$$S = \frac{1}{2} * \frac{17.3275}{7.25} * (5.162)^2 = 31,84226 \text{ m}$$