EXCELLENCE –TYPE ALGEBRA QUESTION.

A woman travels to work by first walking then taking a bus.
The distance travelled on the bus is 5 times the distance she walks.
The total distance travelled is 12 Km.
The bus travels 10 times faster than she walks and the whole journey takes 25 min.
Find how fast she walks.

Special help:
Let the distance she walks be *d*
So the distance the bus goes is

Make an equation for distance.

Let her walking speed = *v*
So the speed of the bus =

Using SPEED = $\frac{\text{DISTANCE}}{\text{TIME}}$ we use TIME = $\frac{\text{DISTANCE}}{\text{SPEED}}$

Make an equation for time taken to walk + time taken on bus = 25 min and solve it to find v.
I suggest you keep distances in metres and times in seconds so that your answer will be in metres per second.

SOLUTION.

Let the distance she walks be *d*
So the distance the bus goes is *5d*

Make an equation for distance. $d + 5d = 12{,}000 \text{ metres}$

$$6d = 12000$$

$$d = 2000 \text{ m}$$

Let her walking speed = *v*
So the speed of the bus = *10v*

Using SPEED = $\frac{\text{DISTANCE}}{\text{TIME}}$ we use TIME = $\frac{\text{DISTANCE}}{\text{SPEED}}$

Make an equation for time taken to walk + time taken on bus = 25 min and solve it to find v.

$$\frac{2000}{v} + \frac{10{,}000}{10v} = 25 \times 60 \text{ sec}$$

$$\frac{2000}{v} + \frac{1000}{v} = 1500$$

$$2000 + 1000 = 1500v$$

$$3000 = 1500v$$

$$v = 2 \text{ m/s}$$