

### Answer on Question #47242 – Physics - Mechanics | Kinematics | Dynamics

a man walk up a stationry escalator in 90 sec when this man stands on a moving escalator he goes up in 60sec the time taken by the man to walk up the moving escalator is ?

#### Solution:

Let the distance of the escalator be  $S$ ;

$u$  –velocity of the escalator;

$v$  –velocity of the man;

$t_1 = 90\text{ s}$  – time to walk up stationary escalator;

$t_2 = 60\text{ s}$  – time to stand on a moving escalator;

$t_3$  – time to go up on a moving escalator;

On a stationary escalator:

$$t_1 = \frac{S}{v}$$
$$v = \frac{S}{t_1} \quad (1)$$

On a moving escalator:

$$t_2 = \frac{S}{u}$$
$$u = \frac{S}{t_2} \quad (2)$$

Walking up on a moving escalator:

$$t_3 = \frac{S}{u + v} \quad (3)$$

(1)and(2)in(3):

$$t_3 = \frac{S}{\frac{S}{t_1} + \frac{S}{t_2}} = \frac{S}{\frac{S(t_1 + t_2)}{t_1 t_2}} = \frac{t_1 t_2}{t_1 + t_2} = \frac{90\text{s} \cdot 60\text{s}}{90\text{s} + 60\text{s}} = 36\text{ s}$$

**Answer:** 36 sec