

A man riding on a bicycle covers a distance of 60 km in a direction of a wind comes back to his original position in 8 hours if the speed of the wind is 10 km/hr find the speed of the cycle

Solution:

Let x - the speed of the cycle ($x > 0$), then

$(x+10)$ - the speed of the cycle in a direction of a wind

$(x-10)$ - the speed of the cycle against the wind

Hence

$$\frac{60}{x+10} + \frac{60}{x-10} = 8$$

Multiplying both sides on $(x+10)(x-10)$

$$60x - 600 + 60x + 600 = 8x^2 - 800$$

$$8x^2 - 120x - 800 = 0$$

$$x^2 - 15x - 100 = 0$$

$$x^2 - 15x + 56.25 - 56.25 - 100 = 0$$

$$(x - 7.5)^2 = 156.25$$

$$(x - 7.5) = 12.5$$

$$x = 20$$

Answer: the speed of the cycle is 20 km/hr