

A motorcycle drives from A to B with a uniform speed of 30 km/h and return back with a speed of 20 km/h.
Find the average speed

Solution:

Let v_{avg} -average speed.

Let $v_1 = 30 \frac{km}{h}$, $v_2 = 20 \frac{km}{h}$

Let S – distance from A to B

Time taken from A to B is $t_1 = \frac{S}{v_1}$

Time taken from B to A is $t_2 = \frac{S}{v_2}$

Total distance travelled is: 2S

So

$$v_{avg} = \frac{2S}{\frac{S}{v_1} + \frac{S}{v_2}} = 2 \frac{v_1 v_2}{v_1 + v_2} = 24 \text{ km/h}$$

Answer: 24 km/h