

Task. A particle moves along a semicircle of radius 10m in 5 seconds. What is the average velocity of the particle?

Solution. The length of the circle of radius r is equal to

$$l = 2\pi r.$$

By assumption, during $t = 5$ sec. the particle passed a semicircle of radius $r = 10$ m, so the length of this part is equal to

$$d = l/2 = \frac{2\pi r}{2} = \pi r.$$

Therefore the average velocity is equal to

$$v = \frac{d}{t} = \frac{\pi r}{t} = \frac{3.14 * 10}{5} = 6.18 \text{ m/s.}$$

Answer. 6.18 m/s.