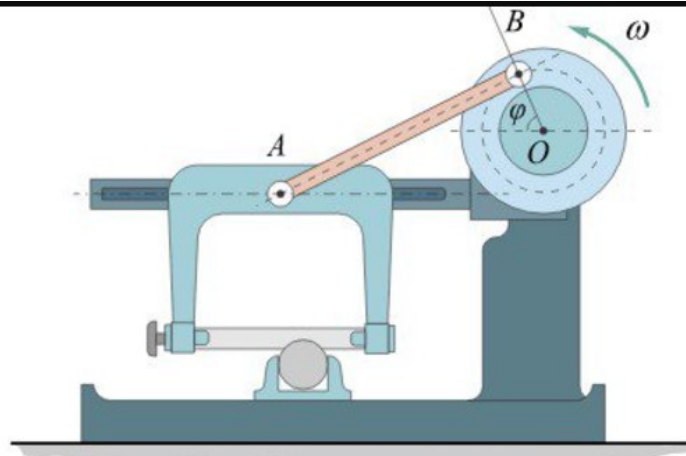




Найти скорость точки A электрической пилы (м/с), если $\omega = 9 \text{ рад/с}$, $\varphi = 60^\circ$, $\angle ABO = 90^\circ$, $AB = 55 \text{ см}$, $OB = 14 \text{ см}$.

$$X_b = X_o - OB \cdot \cos(\phi)$$

$$Y_b = Y_o + OB \cdot \sin(\phi)$$

$$\phi = \phi_0 + \omega t$$

$$X_b = X_o - OB \cdot \cos(\phi)$$

$$Y_a = Y_o + OB \cdot \sin(\phi_0) - AB \cdot \cos(\phi_0) = \text{const}$$

$$X_a = x$$

$$AB^2 = (X_b - X_a)^2 + (Y_b - Y_a)^2$$

$$(AB^2)' = ((X_b - X_a)^2 + (Y_b - Y_a)^2)'$$

$$0 = (X_b - X_a)(X_b - X_a)' + (Y_b - Y_a)(Y_b - Y_a)'$$

$$0 = (X_b - x)(OB \cdot \sin(\phi) \cdot \omega - x') + (Y_b - Y_a) \cdot OB \cdot \cos(\phi) \cdot \omega$$

$$x' - OB \cdot \sin(\phi) \cdot \omega = \frac{(Y_b - Y_a)}{(X_b - x)} \cdot OB \cdot \cos(\phi) \cdot \omega$$

$$x' = \left(\frac{(Y_b - Y_a)}{(X_b - x)} \cdot \cos(\phi) + \sin(\phi) \right) \cdot OB \cdot \omega = (\tan(\angle A) \cdot \cos(\phi) + \sin(\phi)) \cdot OB \cdot \omega$$

$$\text{при } t = 0 \angle A = 180 - \phi - 90 = 90 - \phi$$

$$x' = (\tan(90 - \phi) \cdot \cos(\phi) + \sin(\phi)) \cdot OB \cdot \omega = (\tan(90 - \phi) \cdot \cos(\phi) + \sin(\phi)) \cdot OB \cdot \omega =$$

$$= \left(\frac{\cos(\phi)}{\sin(\phi)} \cdot \cos(\phi) + \sin(\phi) \right) \cdot OB \cdot \omega = \frac{OB \cdot \omega}{\sin(\phi)} = \frac{0,14 \cdot 9}{\sin\left(\frac{\pi}{3}\right)} = 1,454923 \text{ м/с} \approx 1,45 \text{ м/с}$$