5. $M_{\kappa} \sim W^2$ $M_{\kappa} \sim W^{\frac{1}{2}}$

$M = J \cdot \varepsilon$

$k\sqrt{W} = J \dfrac{dW}{dt}$

$k \cdot dt = \dfrac{J}{\sqrt{W}} dW$

$kt = 2J\sqrt{W}$

$W = \dfrac{k^2 t^2}{4J^2}$

пусть $n = \dfrac{k^2}{4J^2}$

$W = n t^2$

Нам надо $\dfrac{dW}{dt}$

$W = \dfrac{d\alpha}{dt}$

$\Rightarrow \overline{W} = \dfrac{\alpha}{t}$

$\alpha = \int n t^2 dt =$

$= \dfrac{1}{3} n t^3$

$\overline{W} = \dfrac{\alpha}{t} = \dfrac{1}{3} n t^2 = \dfrac{W}{3} = 15 \text{ рад/s}$