A tub of a washer start from rest and reach an angular speed of 5 rev/s in 8s. Then, tub slows to rest in 12s. through how many revolutions does the tub turn during the entire 20 s interval? Angular acceleration is constant during starting and stopping

1) For starting:
   Angular acceleration equals:
   $\beta_{start} = \frac{\Delta\omega_{start}}{\Delta t_{start}}$
   $\Delta\omega_{start}$ – changing of angular velocity
   Δt_{start} – time
   $\beta_{start} = \frac{\frac{5rev}{s}}{8s} = \frac{5}{8} rev/s^2$
   Number of revolutions for motion with constant angular acceleration equals:
   $N_{start} = \frac{\beta_{start}\Delta t_{start}^2}{2} = \frac{\frac{5}{8}8^2}{2} = 5 * \frac{8}{2} = 20$
2) For stopping:
   Angular acceleration equals:
   $\beta_{\text{stop}} = \frac{\Delta\omega_{\text{stop}}}{\Delta t_{\text{stop}}}$
   $\Delta\omega_{\text{stop}}$ – changing of angular velocity
   Δt_{stop} – time
   $\beta_{\text{stop}} = \frac{\frac{5rev}{s}}{12s} = \frac{5}{12} rev/s^2$
   Number of revolutions for motion with constant angular acceleration equals:
   $N_{\text{stop}} = \frac{\beta_{\text{stop}}\Delta t_{\text{stop}}^2}{2} = \frac{\frac{5}{12}12^2}{2} = 5 * \frac{12}{2} = 30$

Finally, total number of revolutions equals:

$N_{total} = N_{start} + N_{stop} = 20 + 30 = 50$

Answer: 50.

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