**Cinemática de cuerpo rígido**

Tomado del Hibbeler. Problemas fundamentales

|  |  |  |
| --- | --- | --- |
| F16-1. When the gear rotates 20 revolutions, it achieves an angular velocity of ω=30 rad/s, starting from rest. Determine its constant angular acceleration and the time required.  Rta: α = 3,581 rad/s2, *t* = 8,38 s |  | |
| Fl6-2. The flywheel rotates with an angular velocity of ω=0,005θ2 rad/s, where θ is in radians. Determine the  angular acceleration when it has rotated 20 revolutions.  Rta: 99,2 rad/s2  F16-3. The flywheel rotates with an angular velocity of ω=4θ1/2 rad/s, where θ is in radians. Determine the time it takes to achieve an angular velocity of ω=150 rad/s. Posición inicial θ=0. Rta: 18,75 s. |  | |
| F16-4. The bucket is hoisted by the rope that wraps around  a drum wheel. If the angular displacement of the wheel is θ=(0,5*t*3 + 15*t*) rad, where t is in seconds, determine the  velocity and acceleration of the bucket when *t* = 3 s.  Rta: 21,4 pie/s, 6,75 pie/s2 |  | |
| F16-5. A wheel has an angular acceleration of α=0,5·θ rad/s2, where θ is in radians. Determine the magnitude of the velocity and acceleration of a point located on its rim after the wheel has rotated 2 revolutions. The wheel has a radius of 0,2 m and starts from rest. Rta: 1,78 m/s; 15,8 m/s2. | |  |
| F16-6. For a short period of time, the motor turns gear A with a constant angular acceleration of α = 4.5 rad/s2, starting from rest. Determine the velocity of the cylinder and the distance it travels in 3 seconds. The cord is wrapped around pulley D which is rigidly attached to gear B.  Rta:0,5625 m/s; 844 mm. | α=4,5 rad/s2 | |