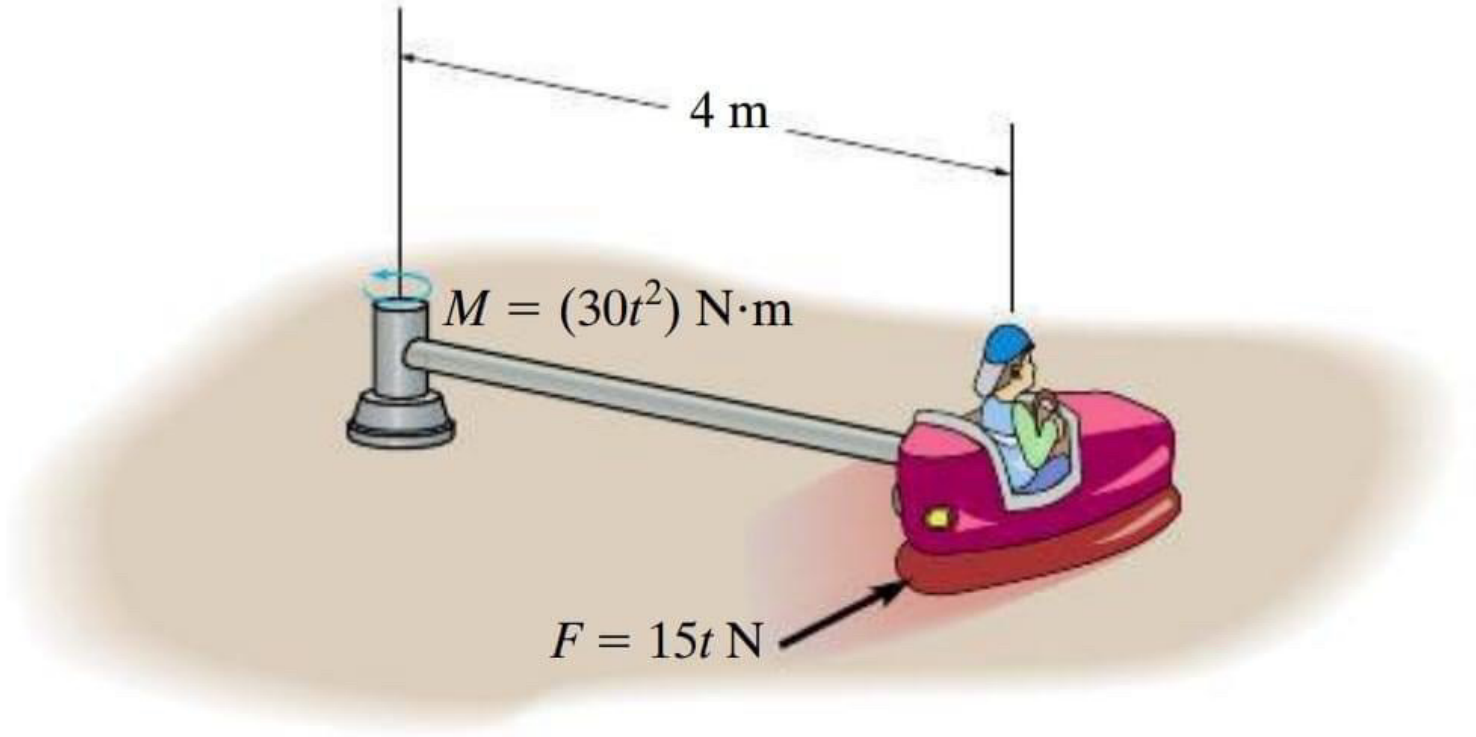
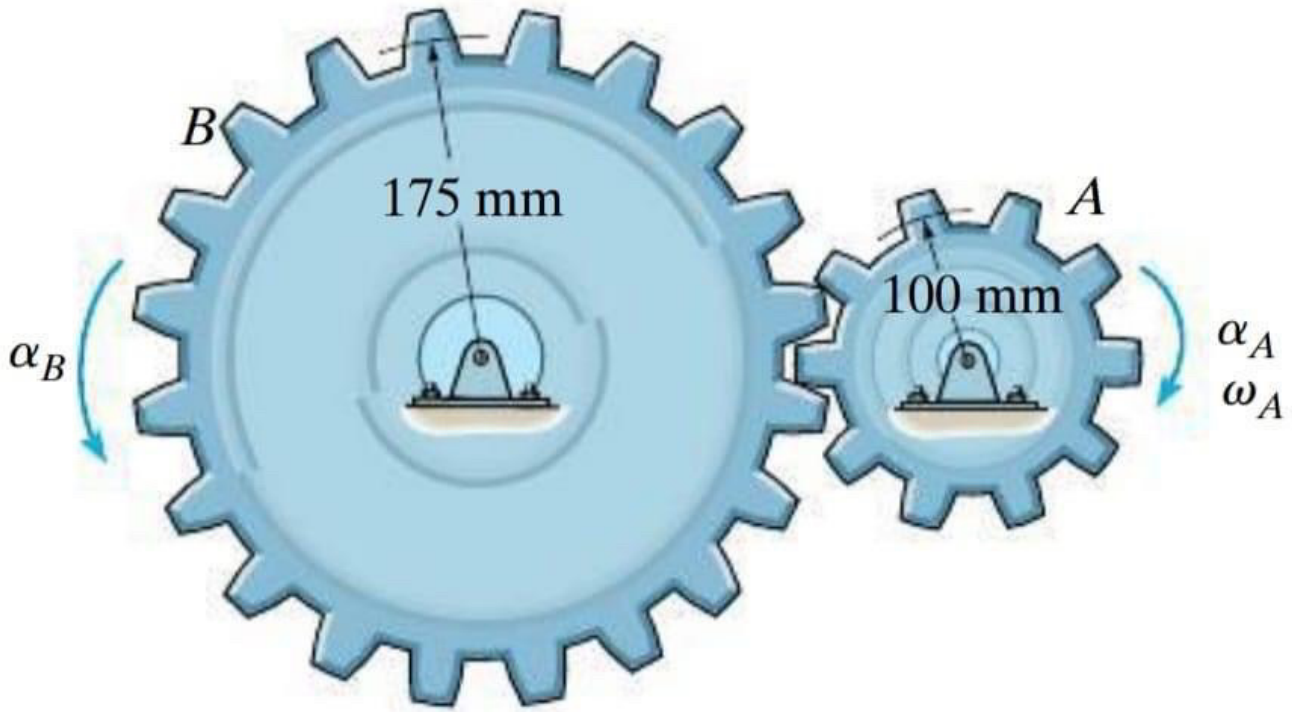
15–103. If the rod of negligible mass is subjected to a couple moment of $M = (30t^2)$ N · m, and the engine of the car supplies a traction force of $F = (15t)$ N to the wheels, where t is in seconds, determine the speed of the car at the instant $t = 5$ s. The car starts from rest. The total mass of the car and rider is 150 kg. Neglect the size of the car.



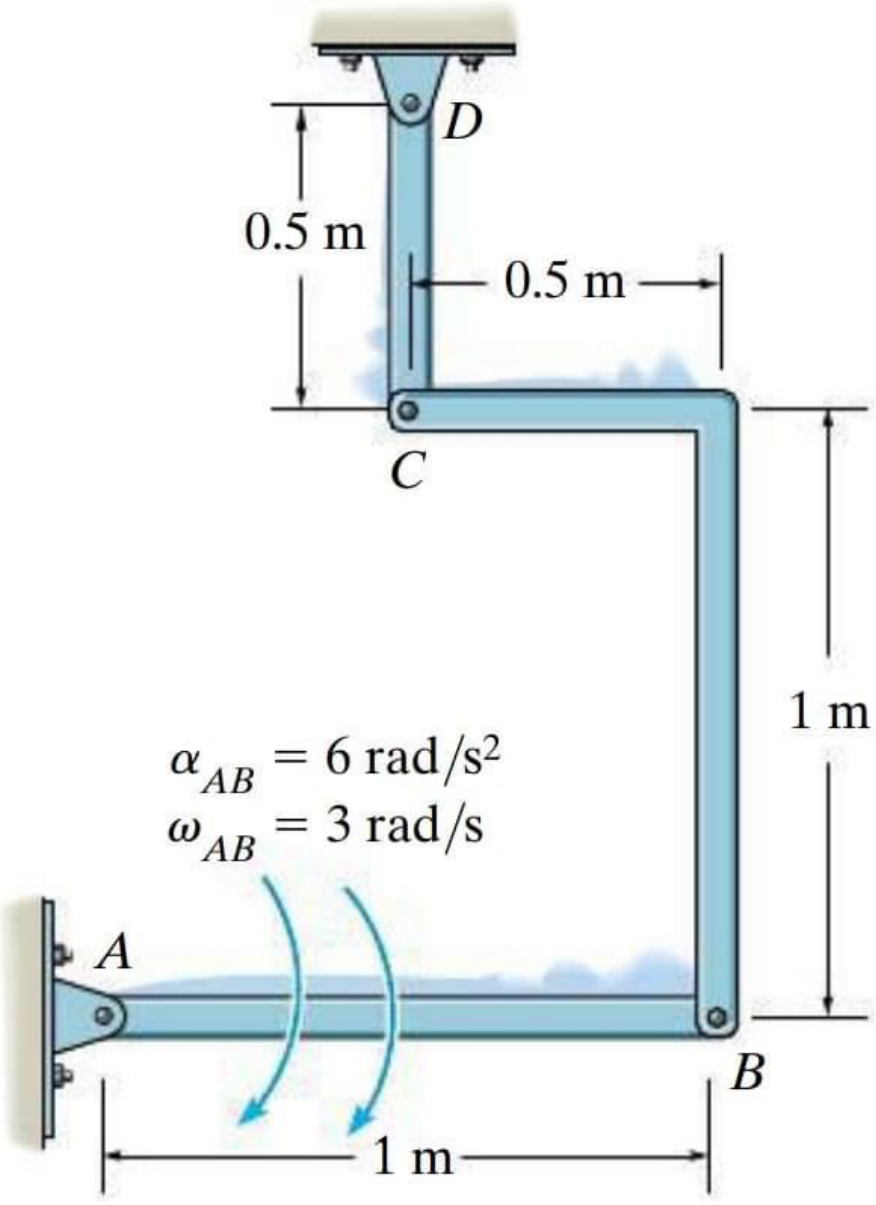
Prob. 15–103

16–17. A motor gives gear A an angular acceleration of $\alpha_A = (2 + 0.006\ \theta^2)\ \text{rad/s}^2$, where θ is in radians. If this gear is initially turning at $\omega_A = 15\ \text{rad/s}$, determine the angular velocity of gear B after A undergoes an angular displacement of 10 rev.



Probs. 16–17/18

16–115. Determine the angular acceleration of link CD if link AB has the angular velocity and angular acceleration shown.



Prob. 16–115