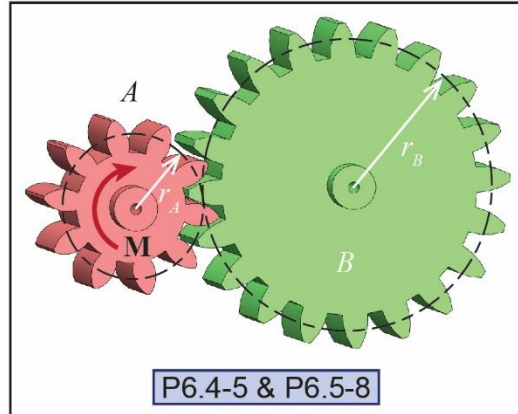


P6.4-5) Gear A is driven by a torque M . What torque is required to drive gear B at a constant angular acceleration of 10 rad/s^2 ? The gear system has the following parameters.

- $I_{\text{gear,center}} = mr^2/2$
- $r_A = 1 \text{ ft}$
- $r_B = 2 \text{ ft}$
- Weight of gear $A = 28 \text{ lb}$
- Weight of gear $B = 48 \text{ lb}$

Given:

Find:



Solution:

Draw a free-body diagram of each gear.

Relate the angular acceleration of gear A to that of gear B .

$$\alpha_A = \text{_____} \alpha_B$$

Use the equation of motion of the two gears to determine the torque.

Calculate the mass moment of inertia for both gears about their centers.

$$I_A = \text{_____}$$

$$I_B = \text{_____}$$

$$M = \text{_____}$$