An electric motor running at 1750 rev/min drives a pump through single-stage reduction gearing. The motor pinion has 16 teeth and the spur gear on the pump shaft has 80 teeth. At what speed will the pump rotate?

Solution:

For the single-stage reduction gearing linear velocities of the motor pinion and pump shaft are identical, hence the speed is inversely proportional to the number of teeth on each element:

$$\frac{16 \; teeth}{80 \; teeth} = \frac{\omega_{pump}}{1750 \; \frac{rev}{min}}$$

$$\omega_{pump} = \frac{16 \; teeth}{80 \; teeth} \cdot 1750 \; \frac{rev}{min} = 350 \frac{rev}{min}$$

Answer: rotational speed of the pump is $350\frac{rev}{min}$