Ex 8)

- **A two-tooth worm is mated with a 30-tooth gear. The diametral pitch of the gear is $P_G = 6$. The pitch dia. of the worm is $d_W = 2$ in. Find**

a) the pitch diameter of the gear

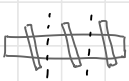
b) the axial pitch of the worm

a. $P_G = 6 \Rightarrow P_G = \frac{N_G}{d_G} \Rightarrow d_G = \frac{N_G}{P_G} = \frac{30}{6} = 5$ in

b. To find d_x, we need to understand the relation between p_x and p_G

↳ p_x : axial pitch of worm

↳ p_G : circular pitch of gear



1 full rotation of the worm (1 lead axial movement) results in the rotation of the gear by N_W teeth,

$\Rightarrow L = N_W p_x = N_W \cdot p_G \Rightarrow p_G = p_x$

$N_G p_G = N_G p_x = \pi d_G \Rightarrow p_x = \frac{\pi d_G}{N_G} = \frac{\pi \cdot 5}{30} = \frac{\pi}{6} = \boxed{0.5236 \text{ in}}$