Fixed Axis Rotation Example Problem 2

Two pulleys A and B are connected by a V belt. Gear A starts from rest and accelerates uniformly at $\alpha_A = 2 \text{ rad/ sec}^2$ in the direction shown. Drum C is pinned to and turns with pulley B. A cable is attached to weight D and wrapped around drum C. After 3 sec, find $s_D$ and $v_D$ for the weight being lifted.
\[ \omega_A = 6 \text{ rad/s} \]
\[ \theta_A = 9 \text{ rad} \]