The crank $OA$ rotates with a constant angular velocity $\omega_{OA} = 4 \text{ rad/s}$. For the instant shown, determine (a) $v_B$ of collar $B$, (b) $v_M$ of the midpoint $M$ of link $AB$.

$v_A = \overline{OA} \omega_{OA} = 20(4) = \overline{CA} \omega_{AB} = 50 \omega_{AB}$, \hspace{1cm} $\omega_{AB} = 1.6 \text{ rad/s}$

$v_B = \overline{CB} \omega_{AB} = 56(1.6) = 89.6$ \hspace{1cm} $\therefore \quad v_B = 89.6 \text{ in./s}$

$v_M = \overline{CM} \omega_{AB} = \sqrt{(48)^2 + (15)^2} \cdot (1.6) = 4.8\sqrt{281}$

$v_M = v_M \cdot \frac{-5\mathbf{i} - 16\mathbf{j}}{\sqrt{281}} = 4.8\sqrt{281} \cdot \frac{-5\mathbf{i} - 16\mathbf{j}}{\sqrt{281}} = -24\mathbf{i} - 76.8\mathbf{j}$

$v_M = -24\mathbf{i} - 76.8\mathbf{j} \text{ in./s}$