

$$500 = 40(40/a) - \frac{1}{2}at^2$$

$$800/a$$

$$s = 40t - \frac{1}{2}at^2$$

$$s = 500 \text{ when } t = 40/a$$

$$v = 40 - at \Rightarrow 0 = 40 - at \Rightarrow t = 40/a$$

$$s = 40t - \frac{1}{2}at^2 + 100$$

$$s = 100, t = 0 \Rightarrow s = 40t - \frac{1}{2}at^2 + 100$$

$$v = \int v dt = \int (40 - at) dt = 40t - \frac{1}{2}at^2 + C$$

$$D = C + AB = \begin{pmatrix} 4 \\ 2 \\ 1 \end{pmatrix} + \begin{pmatrix} 2 \\ -1 \\ 5 \end{pmatrix} = \begin{pmatrix} 6 \\ 1 \\ 6 \end{pmatrix}$$

$$AB = B - A = \begin{pmatrix} 4 \\ 2 \\ 1 \end{pmatrix} - \begin{pmatrix} 2 \\ -1 \\ 5 \end{pmatrix} = \begin{pmatrix} 2 \\ 3 \\ -4 \end{pmatrix}$$

$$OB = \begin{pmatrix} 2 \\ 0 \\ 8 \end{pmatrix} + 14 \begin{pmatrix} 1 \\ 0 \\ 8 \end{pmatrix} = \begin{pmatrix} 16 \\ 0 \\ 112 \end{pmatrix}$$

$$-1 + 5s \Rightarrow t = 14$$

$$1 = 4 - s \Rightarrow s = 3$$

$$8 + 2s = 3 \Rightarrow s = 3$$

$$P_{out} L_1 = L_2 = \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix} + t \begin{pmatrix} 1 \\ 0 \\ 0 \end{pmatrix} + s \begin{pmatrix} 2 \\ -1 \\ 5 \end{pmatrix}$$

$$s = 2, t = 2 \text{ at } A$$

$$2 + 2s = 6 \Rightarrow s = 2$$

$$4 - s = 2 \Rightarrow s = 2$$

$$-1 + 5s = 9 \Rightarrow s = 2$$

$$r = P + t \begin{pmatrix} 0 \\ 0 \\ 1 \end{pmatrix} = \begin{pmatrix} 8 \\ 0 \\ 0 \end{pmatrix} + t \begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix} \quad (4)$$