(12) $A(0,2,0)$ $\angle(AD, AB) = \angle(AD, AC)$

$B(2,3,2)$

$C(2,2,4)$

$P: \frac{x}{1} = \frac{y-3}{2} = \frac{z}{2}$

$D = ?$

$\cos\angle = \frac{\vec{AD} \cdot \vec{AB}}{|AD| \cdot |AB|}$

$\vec{AB} = 2i + j + 2k$

$\vec{AC} = 2i + 4k$

$P: \begin{cases} x = t \\ y = 2t + 3 \\ z = 2t \end{cases}$

$D(t, 2t+3, 2t)$

$\vec{AD} = t \cdot i + (2t+3-2)j + 2tk$

$\frac{\vec{AD} \cdot \vec{AB}}{|AD| \cdot |AB|} = \frac{\vec{AD} \cdot \vec{AC}}{|AD| \cdot |AB|}$

$\frac{2 \cdot t + 2t + 1 + 2 \cdot (2t)}{|AD| \cdot \sqrt{4+1+4}} = \frac{2t + 4(2t)}{|AD| \cdot \sqrt{4+16}} \quad / \cdot |AD|$

$\frac{8t+1}{3} = \frac{10t}{2\sqrt{5}}$

$30t = 2\sqrt{5} \cdot (8t+1)$

$30t = 16\sqrt{5}t + 2\sqrt{5}$

$30t - 16\sqrt{5}t = 2\sqrt{5}$

$t(30 - 16\sqrt{5}) = 2\sqrt{5}$

$t = \frac{2\sqrt{5}}{30 - 16\sqrt{5}}$

$t = \frac{2\sqrt{5}}{2(15 - 8\sqrt{5})}$

$t = \frac{\sqrt{5}}{15 - 8\sqrt{5}}$

$\boxed{t = \frac{-\sqrt{5}}{8\sqrt{5} - 15}}$

$D\left(\frac{-\sqrt{5}}{8\sqrt{5}-15}, \frac{-2\sqrt{5}}{8\sqrt{5}-15} + 3, \frac{-2\sqrt{5}}{8\sqrt{5}-15}\right)$