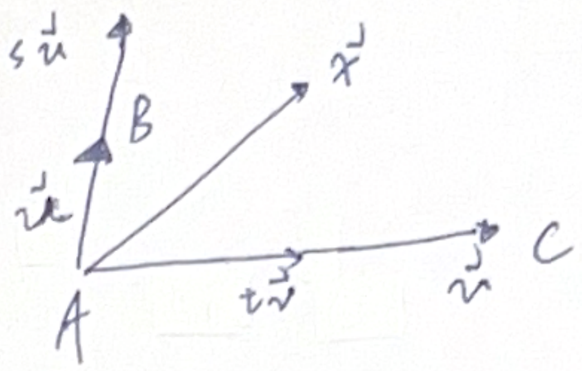
Task 2

①

(2, -5, -1), (0, 4, 6) and (-3, 7, 1)



For any three noncollinear points A, B and C, the plane containing A, B and C is $X = A + s\vec{u} + t\vec{v}$ where x denotes an arbitrary point in the plane and s, t are arbitrary real numbers.

Let A = (2, -5, -1), B = (0, 4, 6), C = (-3, 7, 1)

$\Rightarrow \vec{u} = B - A = (-2, -9, 7)$, $\vec{v} = C - A = (-3, 3, -5)$

$X = (2, -5, -1) + s(-2, -9, 7) + t(-3, 3, -5)$

$s, t \in R$, x is an arbitray point in plane

② (1, 2, 1), (2, 4, 2) and (-3, -6, -3)

$\because \exists\, t = \frac{2}{1} = \frac{4}{2} = \frac{2}{1} = 2$ for (1, 2, 1) and (2, 4, 2)

$\therefore$ Three points are not collinear is not satisfied

The plane is not exists.

③ (1, 1, 1), (2, 5, 2) and (0, 0, 6)

Let A = (1, 1, 1), B = (2, 5, 2), C = (0, 0, 0)

$\vec{u} = B - A = (1, 4, 1)$, $\vec{v} = C - A = (-1, -1, -1)$

$x = (1, 1, 1) + s(1, 4, 1) + t(-1, -1, -1)$

$s, t \in R$, x is an arbitrary point in plane