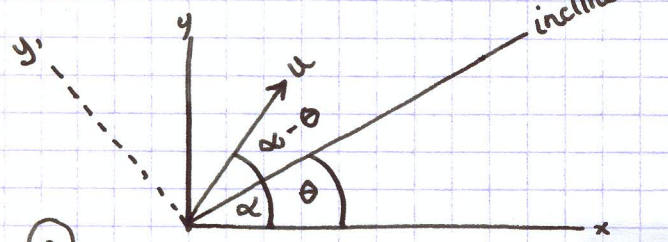
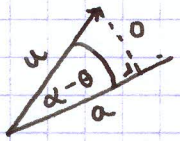
② Projectiles on an inclined plane.

for questions with a projectile fired along an inclined plane, we re-orient our x and y axis such that the x axis lies along the incline.
This has 2 major consequences : on initial velocity
on acceleration due to gravity.

(u)

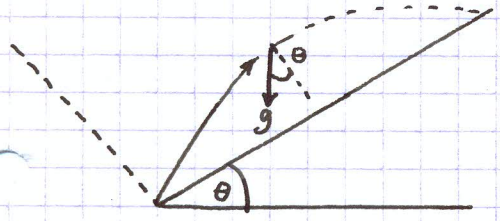


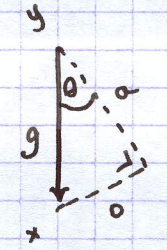


$0 = u\sin(\alpha-\theta)$ (y)

$a = u\cos(\alpha-\theta)$ (x)

(a)





$a = g\cos\theta$ (y)

$0 = g\sin\theta$ (x)

hence, the equations of motion on an inclined plane become :

	horizontal, x	vertical, y.
$\vec{u}$	$u_x = u\cos(\alpha-\theta)$	$u_y = u\sin(\alpha-\theta)$
$\vec{a}$	$a_x = -g\sin\theta$	$a_y = -g\cos\theta$
$\vec{v}$	$v_x = u\cos(\alpha-\theta) - g\sin\theta t$	$v_y = u\sin(\alpha-\theta) - \cos\theta t$
$\vec{s}$	$s_x = u\cos(\alpha-\theta) - \frac{1}{2}g\sin\theta t^2$	$s_y = u\sin(\alpha-\theta) - \frac{1}{2}g\cos\theta t^2$

nb for each vector quantity ie velocity acceleration displacement, we can resolve or split the vector into 2 component vectors i & j (x & y)

NOTE : g, θ are fixed values