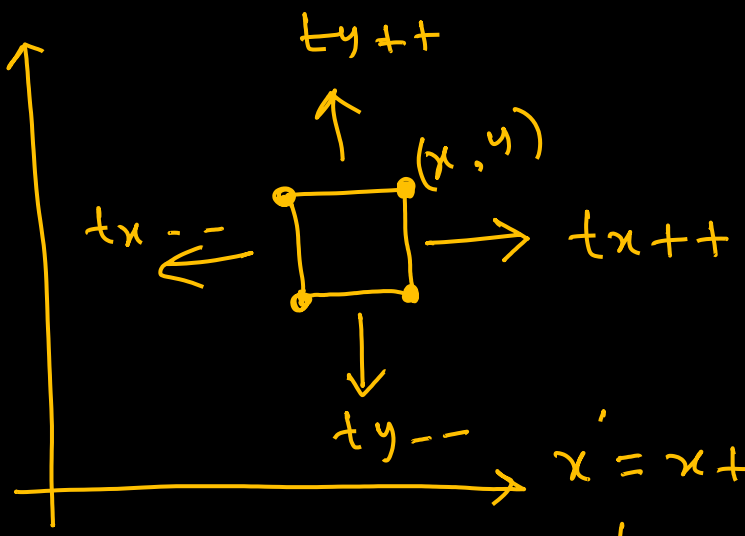
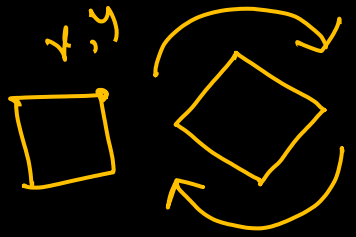
Transformation

① Translation



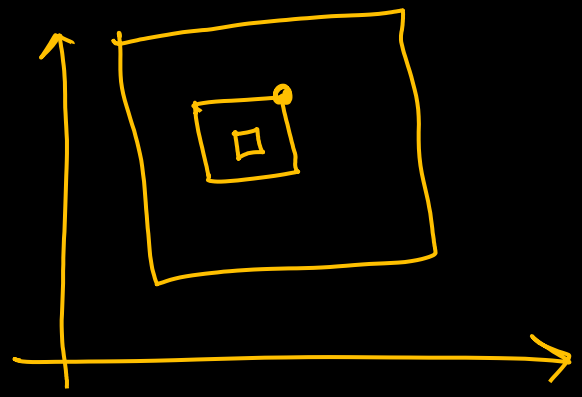
$$x' = x + tx$$
$$y' = y + ty$$

② Rotation



clockwise θ (ve--)

anticlockwise θ (ve++)



$$x' = x\cos\theta \pm y\sin\theta$$
$$y' = x\sin\theta + y\cos\theta$$

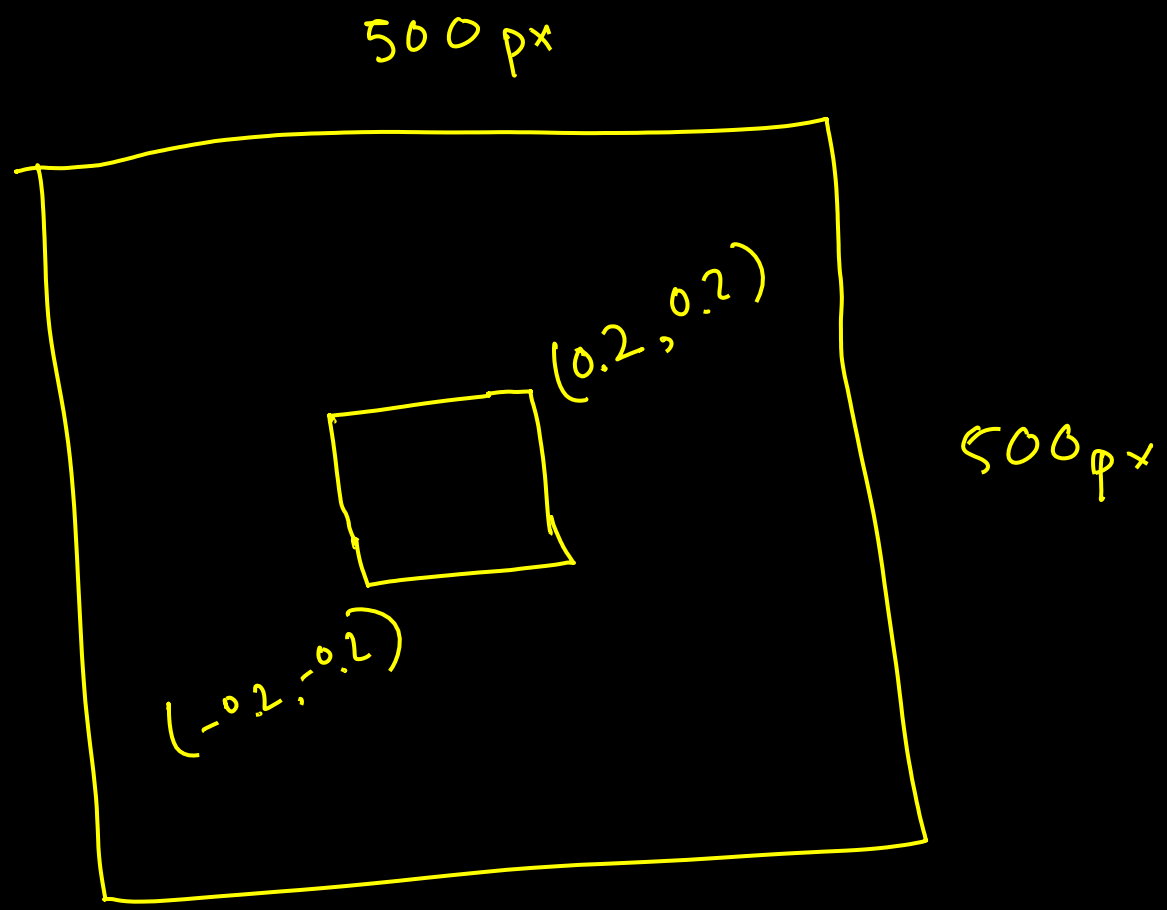
③ Scaling

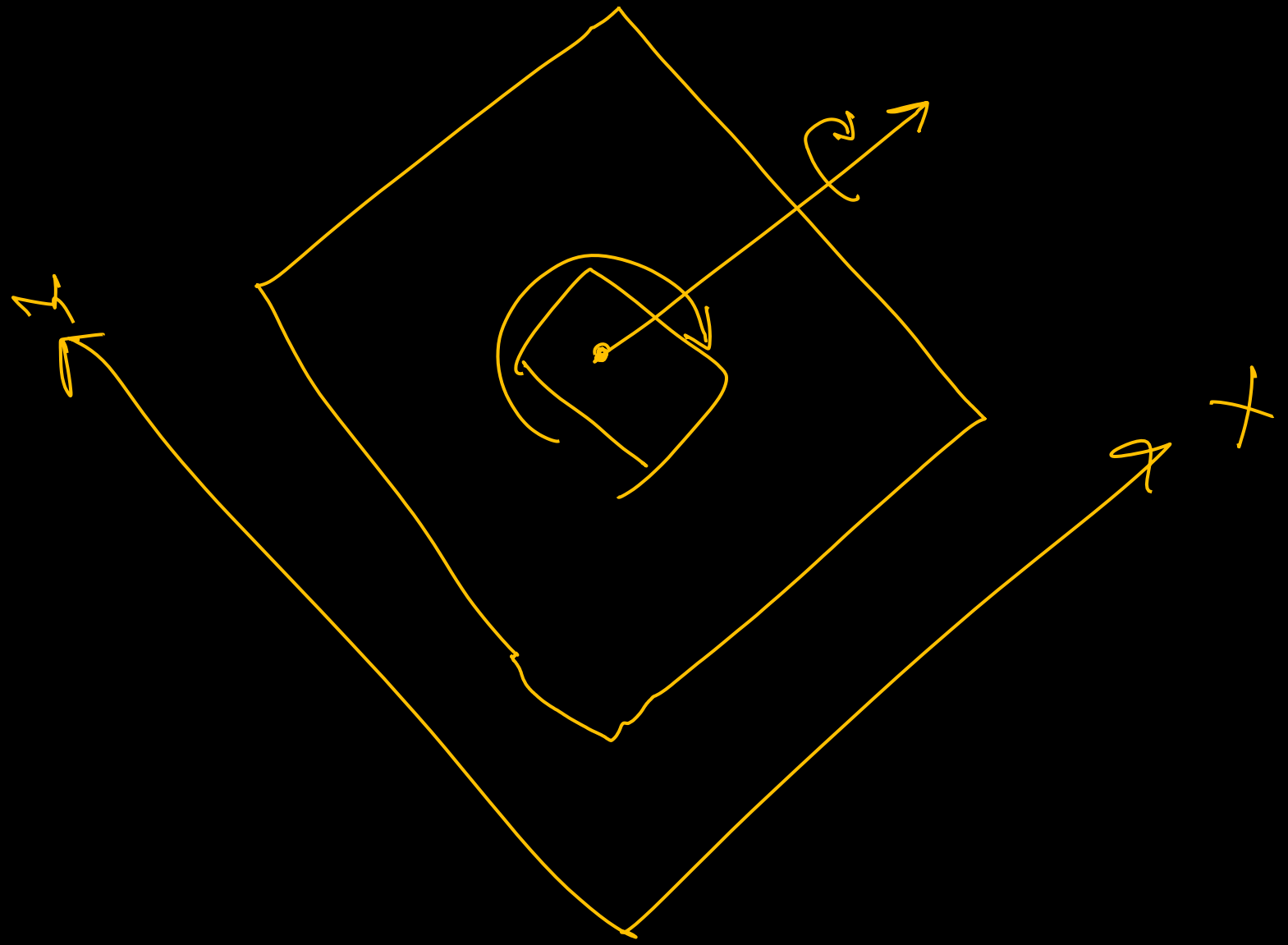
$$x' = x \cdot S_x$$
$$y' = y \cdot S_y$$

$S = 1$ same

$S > 1$ magnify

$S < 1$ shrink


500 px
(0.2, 0.2)
500 px
(-0.2, -0.2)


y
x