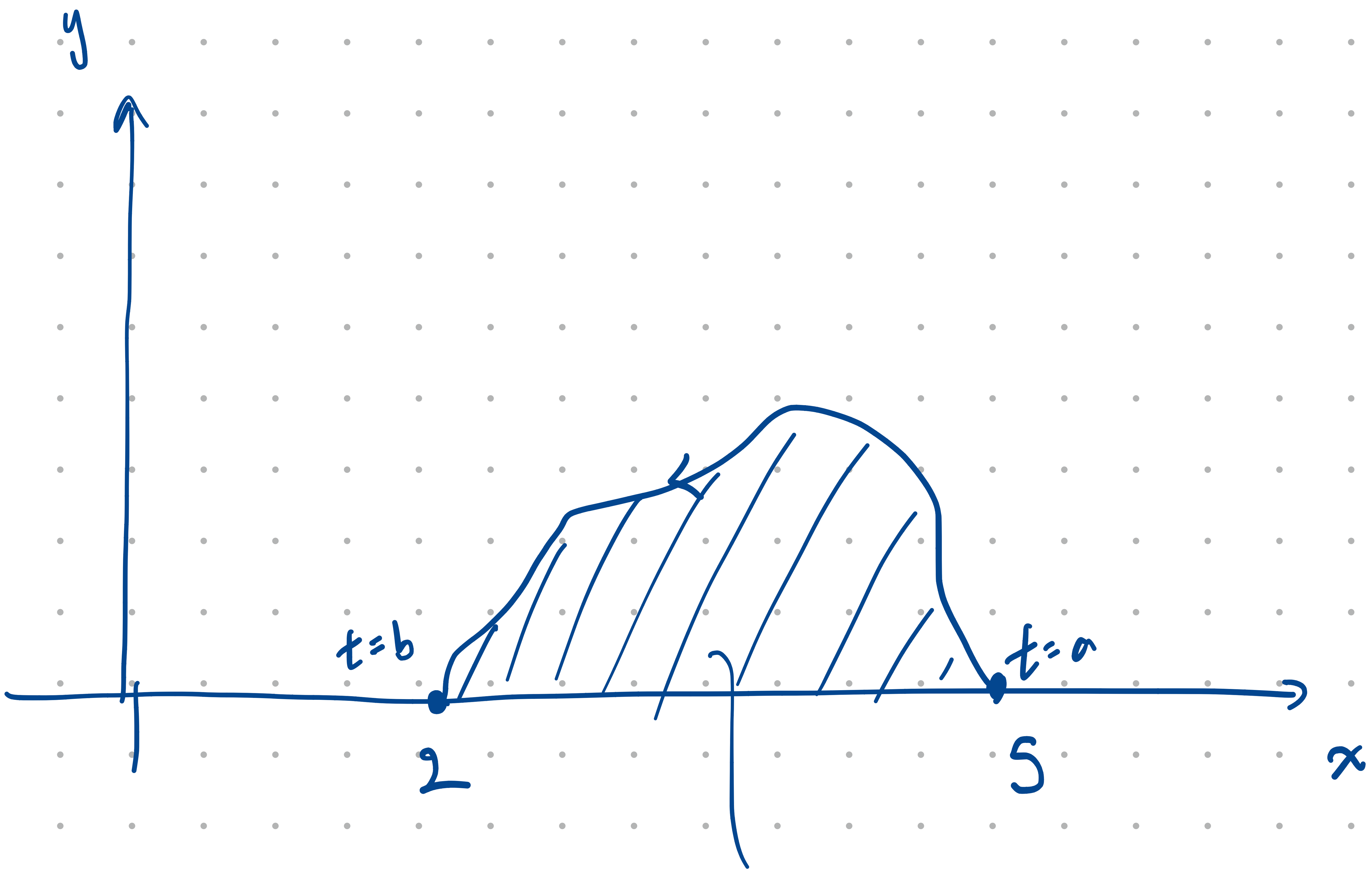
Announcements

- No quiz this weekend
- Reply to my email with your mock exam and answer key. (No later than Monday) Also specify if you would like me to match you. (I will do the matching on Tuesday)
- Next week (RRR) my section times (1-3 PM PT) will be converted to O.H.

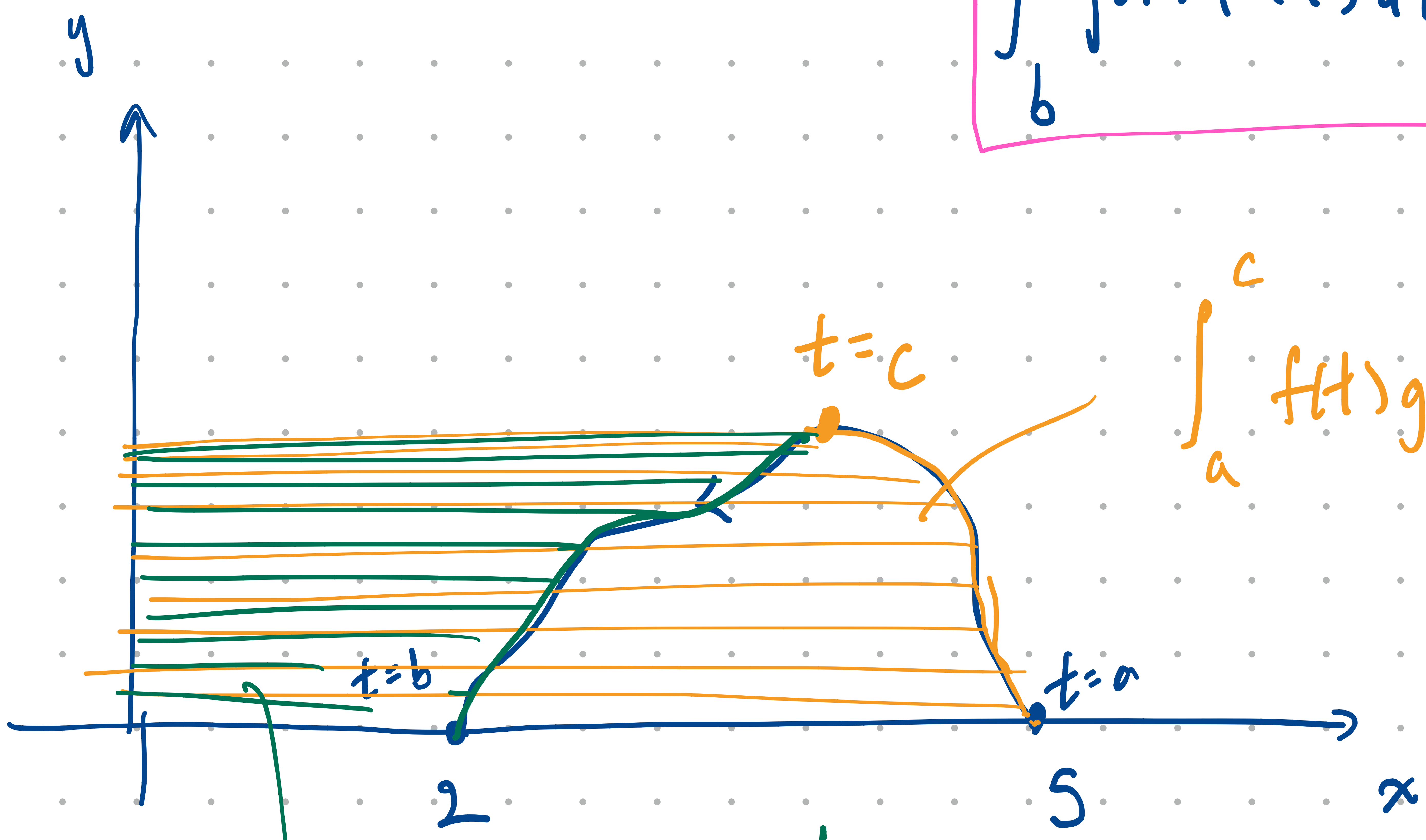
  The usual O.H. will still take place

#1)



$$\int_2^5 y\,dx$$

$$= \boxed{\int_b^a g(t)\,f'(t)\,dt}$$



$$\int_a^c f(t)\,g'(t)\,dt$$

negative of $\int_c^b f(t)\,g'(t)\,dt$

So $\boxed{\int_a^b f(t)\,g'(t)\,dt}$ also gives the desired answer.

$$\underset{\overset{\|}{0}}{\overset{2\,\cdot\,0}{f(b)\,g(b)} - \overset{5\,\cdot\,0}{f(a)\,g(a)}} = \int_a^b \frac{d}{dt}\big(f(t)\,g(t)\big)\,dt$$

$$= \int_a^b \big(f'(t)\,g(t) + f(t)\,g'(t) \big)\,dt$$

$$= \int_a^b f'(t)\,g(t)\,dt + \int_a^b f(t)\,g'(t)\,dt$$

$$\Longrightarrow \int_a^b f'(t)\,g(t)\,dt = \int_b^a f(t)\,g'(t)\,dt$$

#2) Analogy: If you take $y = f(x)$

and look @ $y = f(x-4)$

this moves the picture to the right by 4

"the positive x-direction"

Similarly, $r = f(\theta)$ to $r = f(\theta - \pi/3)$

pos. θ

rotates.

moves the picture in the counterclockwise dir. by $\pi/3$

⚠ Note: This is not a mere reparametrization.

$r = f(\theta)$ means

$x = f(\theta)\cos\theta$

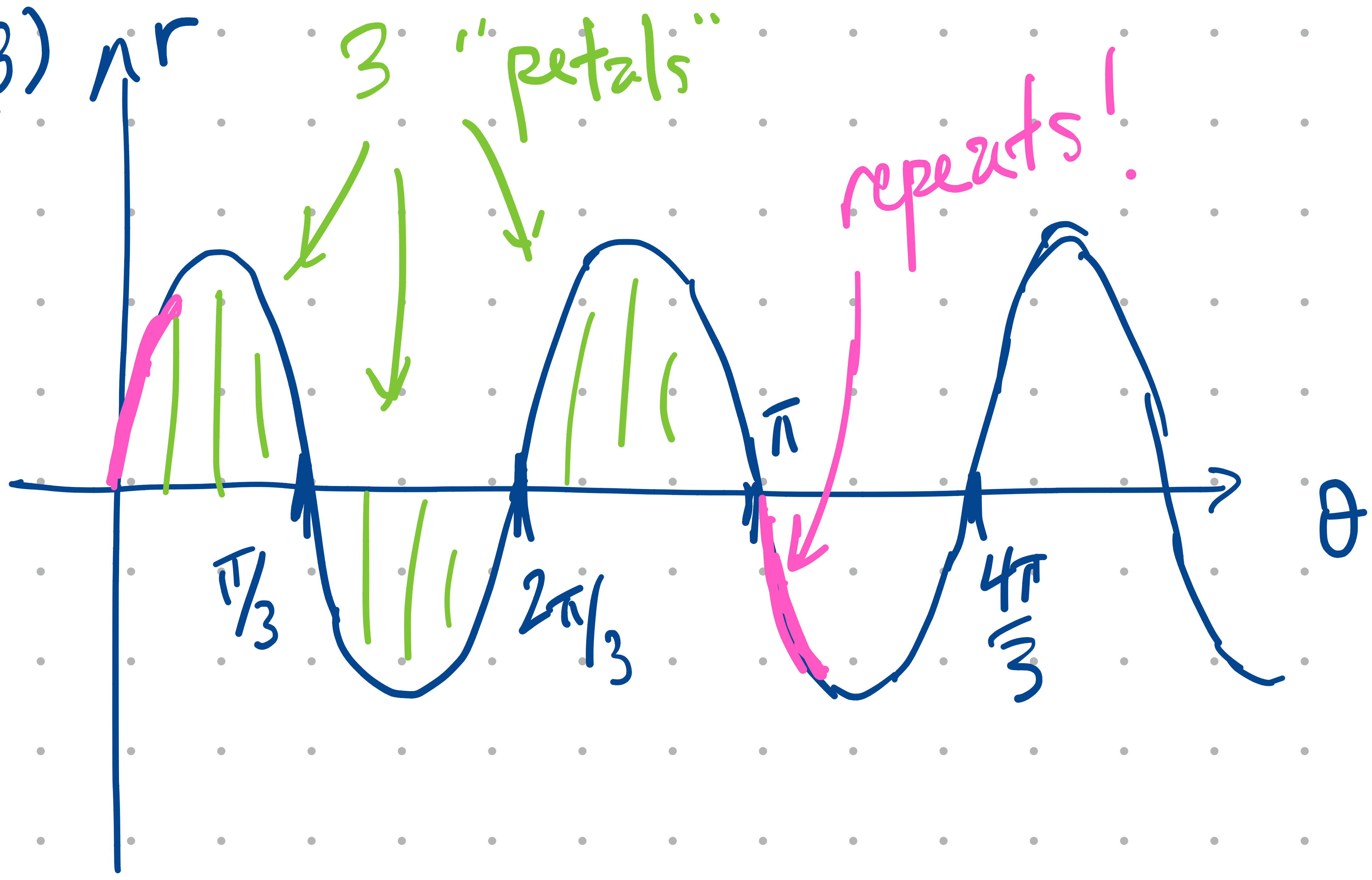
$y = f(\theta)\sin\theta$

$r = f(\theta - \pi/3)$ means

$x = f(\theta - \pi/3)\cos\theta$

$y = f(\theta - \pi/3)\sin\theta$

#3)



First comment:

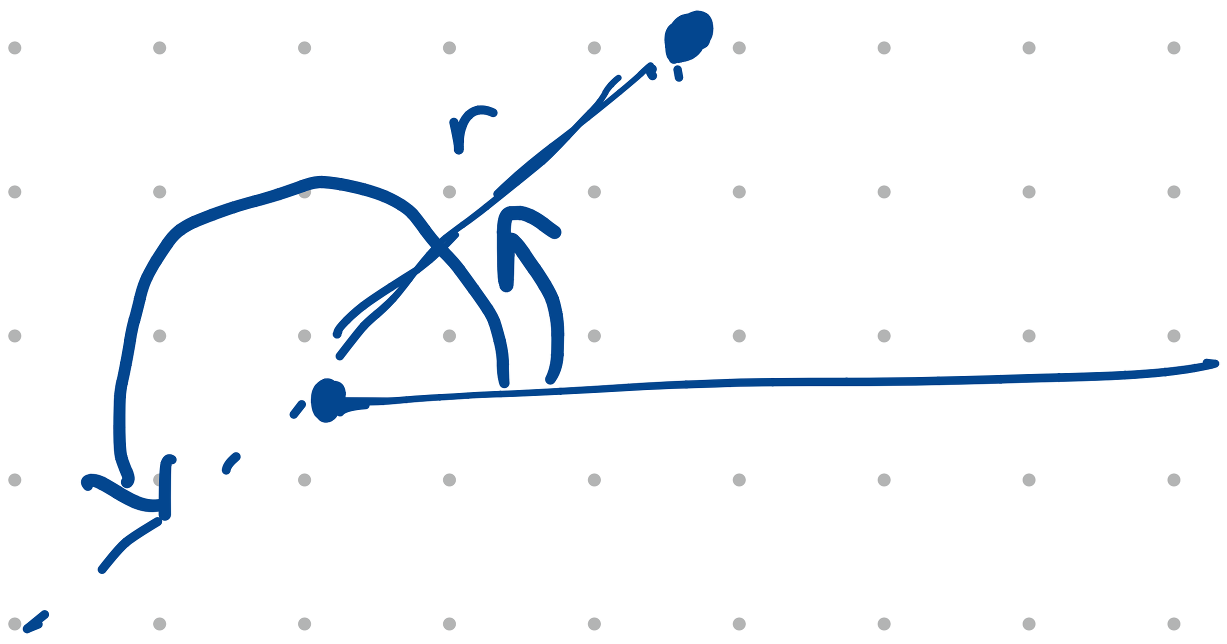
The answer must be a multiple of π

even mult of π

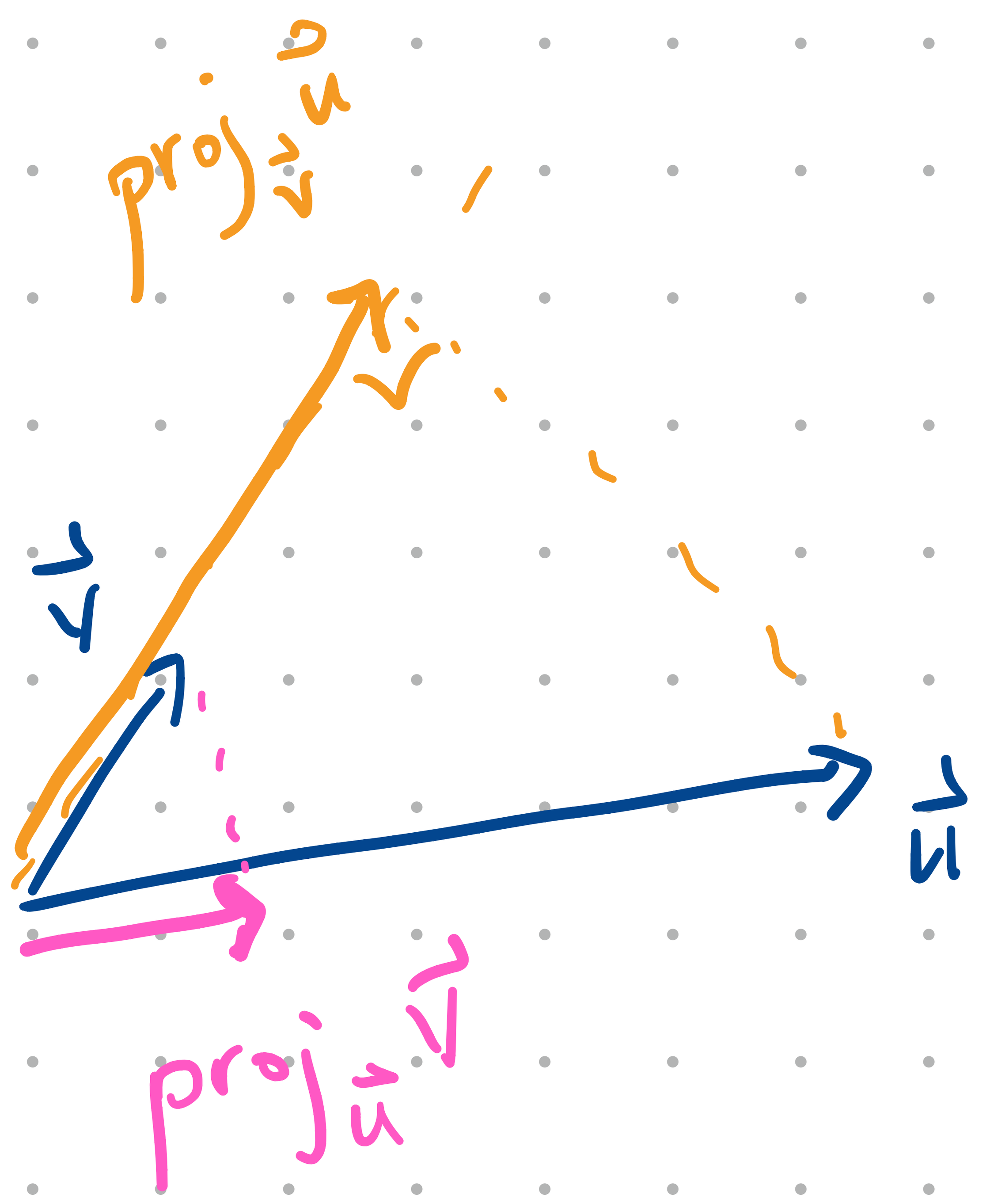
(r, θ) and $(r, \theta + 2\pi)$ are the same point in the xy-plane

(r, θ) and $(-r, \theta + \pi)$ too!

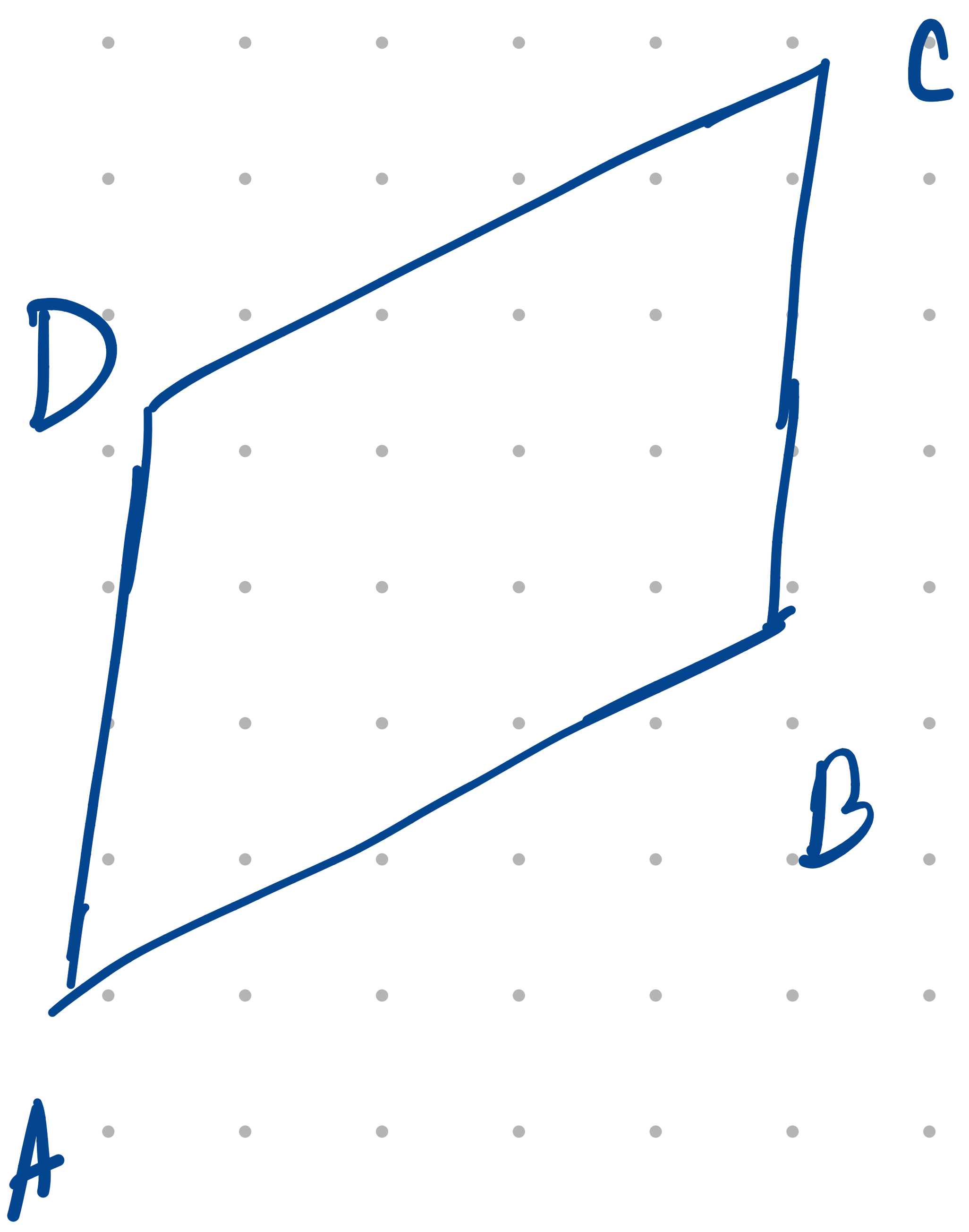
odd mult of π



#5)



#6)



$$\vec{AB} \times \vec{AC}$$

$$= \vec{AB} \times (\vec{AD} + \vec{DC})$$

$$= \vec{AB} \times \vec{AD} + \vec{AB} \times \vec{DC}$$

but $\vec{AB} = \vec{DC}$, in particular parallel so cross prod is 0.

$$= \vec{AB} \times \vec{AD}$$

You can definitely do 7, 8 just by setting up systems of equations and trying to solve, but here are conceptual ways of approaching them:

#7)

No b/c $\langle 1,1,-1\rangle$ is not perpendicular to $\langle 2,1,3\rangle$ (check w/ dot. product)

#8)