Announcements

- No quiz this weekend
- Reply to <u>my email</u> 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

15.9 #11

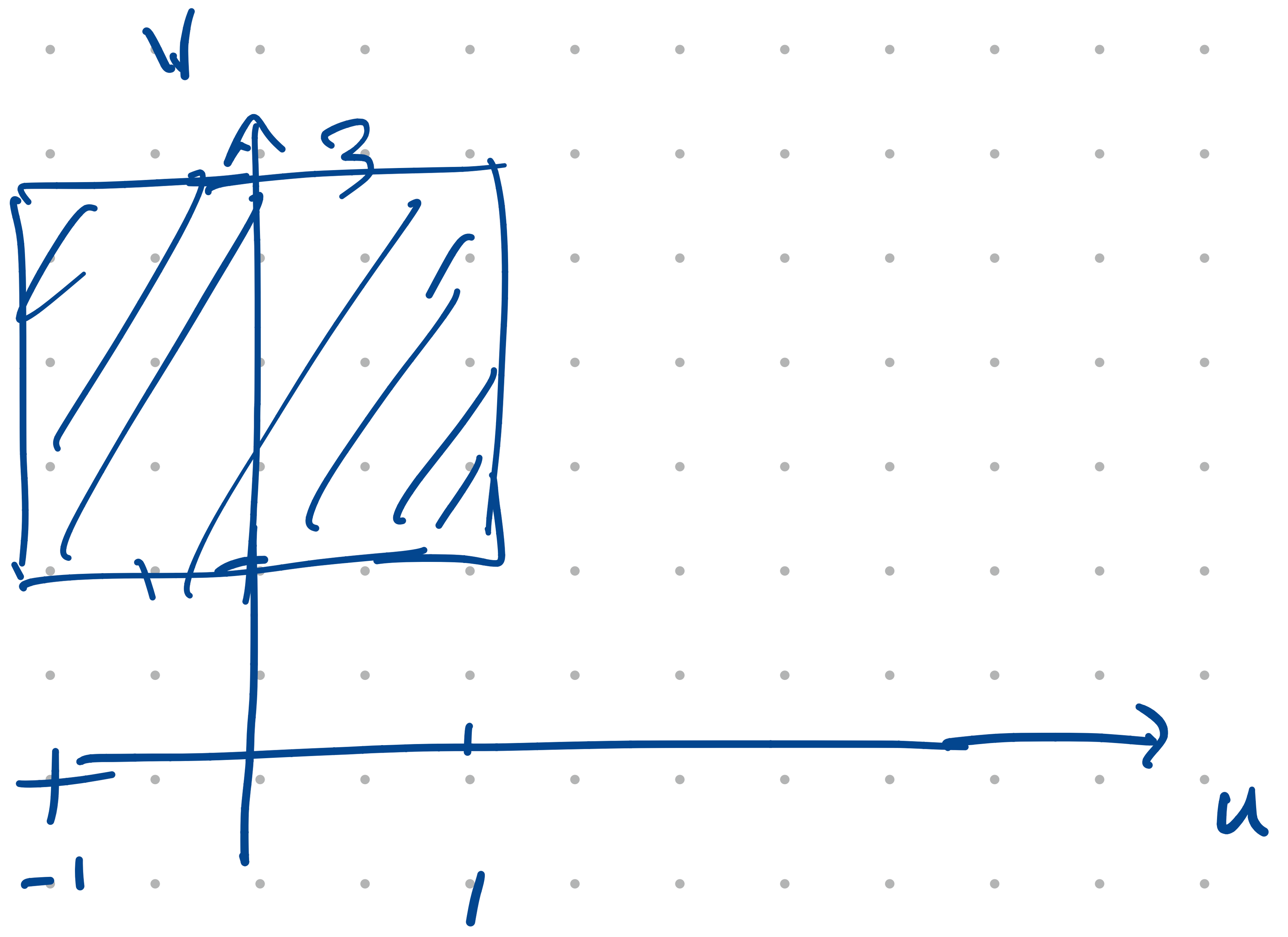
$y = 2x - 1 \qquad y = 1 - x$

$y = 2x + 1 \qquad y = 3 - x$

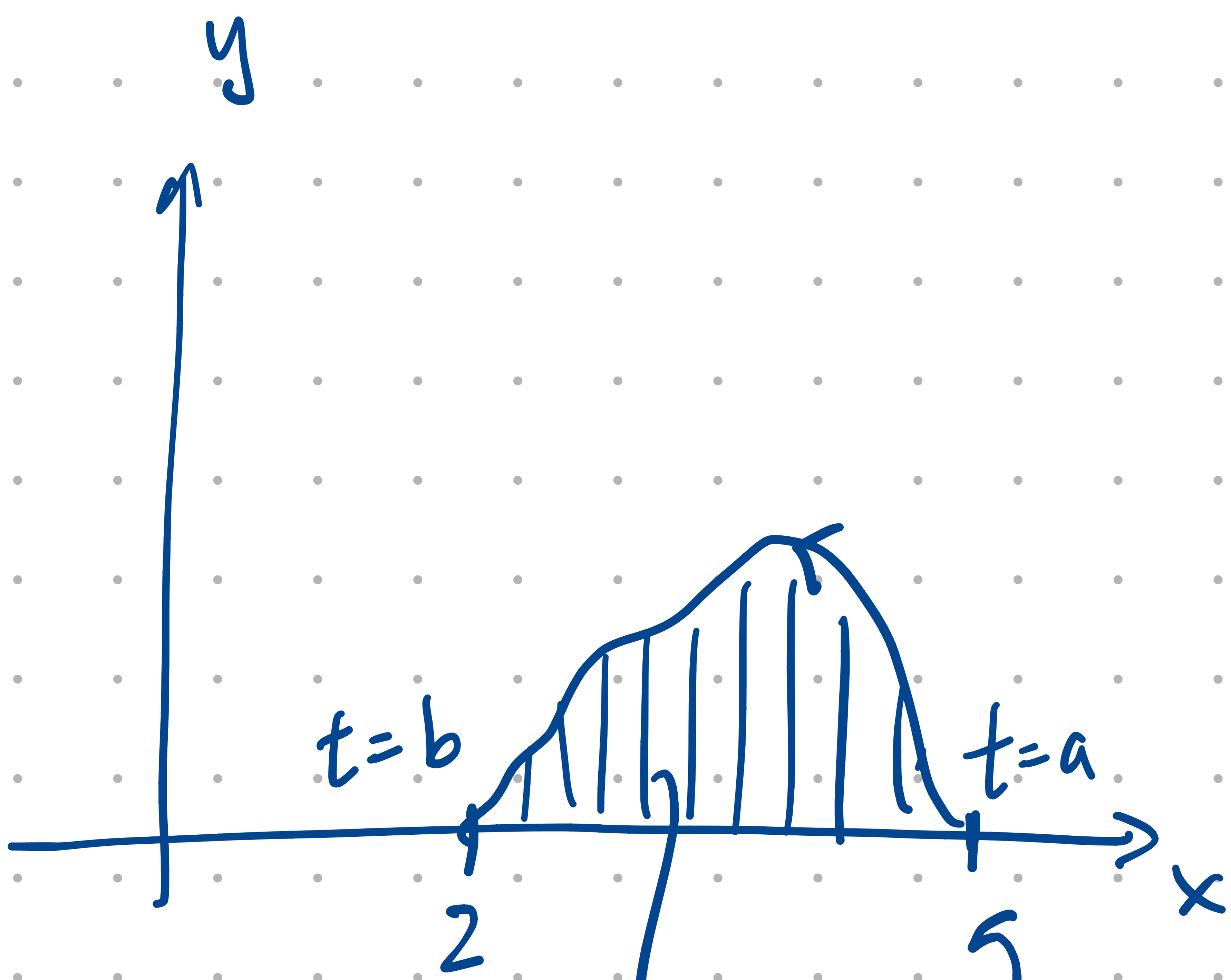
$-1 \le 2x - y \le 1 \qquad 1 \le x + y \le 3$

$u = 2x - y \qquad v = x + y$

Solve for x, y in terms of u, v.

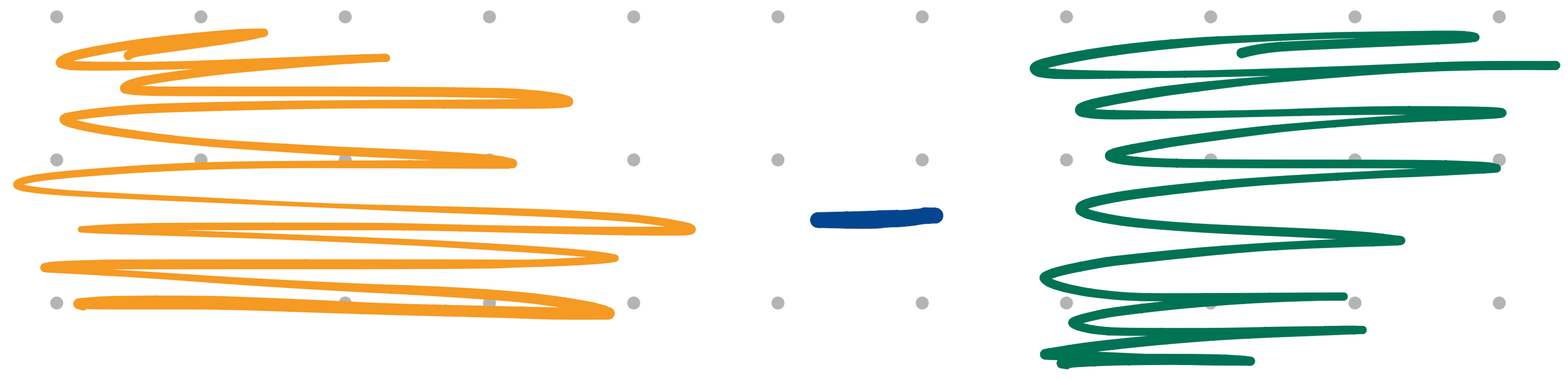


#1)

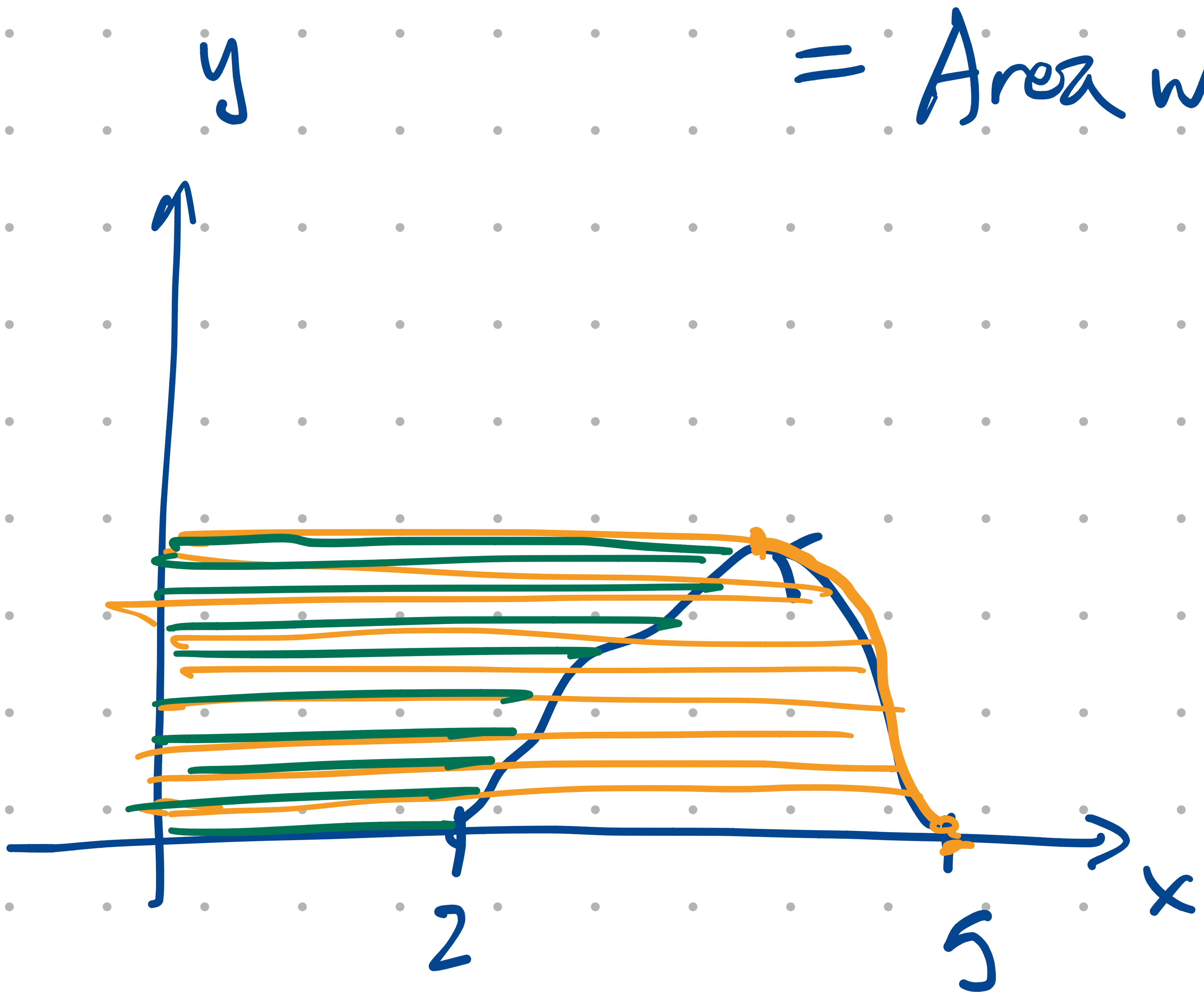


$$\int_2^5 y\,dx = \boxed{\int_b^a g(t)\, f'(t)\,dt}$$

$$\boxed{\int_a^b f(t)g'(t)\,dt} =$$



= Area we want.



#2) <u>Analogy</u>: $y = f(x)$

$y = f(x-3)$ moves <u>to right</u> by 3.

i.e. in the positive x-direction.

$r = f(\theta)$

$r = f(\theta - \pi/3)$ "<u>moving</u> it in <u>positive θ-direction</u> (ccw) by $\pi/3$"

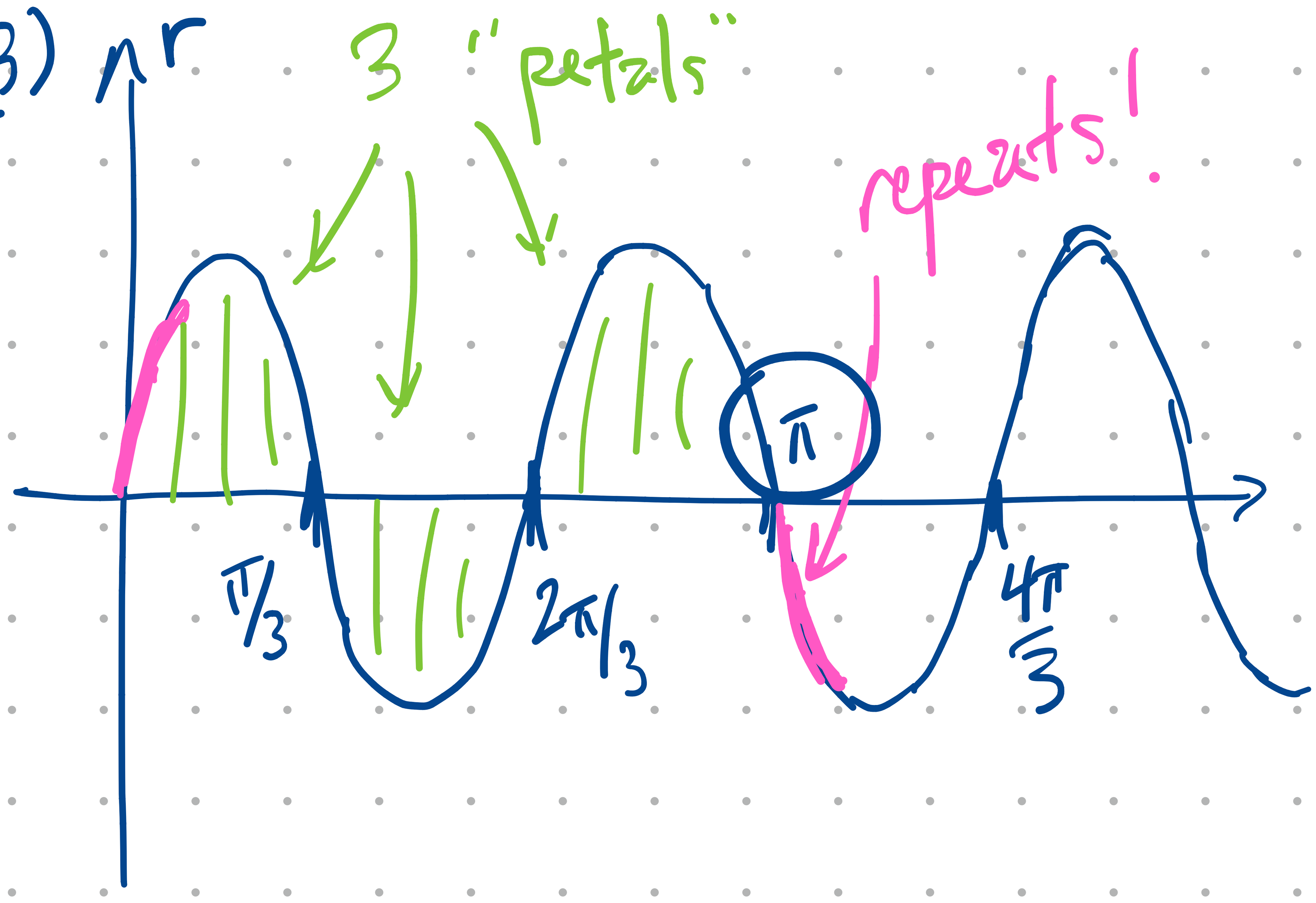
(rotating)

⚠ This is <u>not</u> just a reparametrization:

$r = f(\theta)$ $\rightsquigarrow$ $x = f(\theta)\cos\theta$, $y = f(\theta)\sin\theta$

$r = f(\theta - \pi/3)$ $\rightsquigarrow$ $x = f(\theta - \pi/3)\cos\theta$, $y = f(\theta - \pi/3)\sin\theta$

#3)

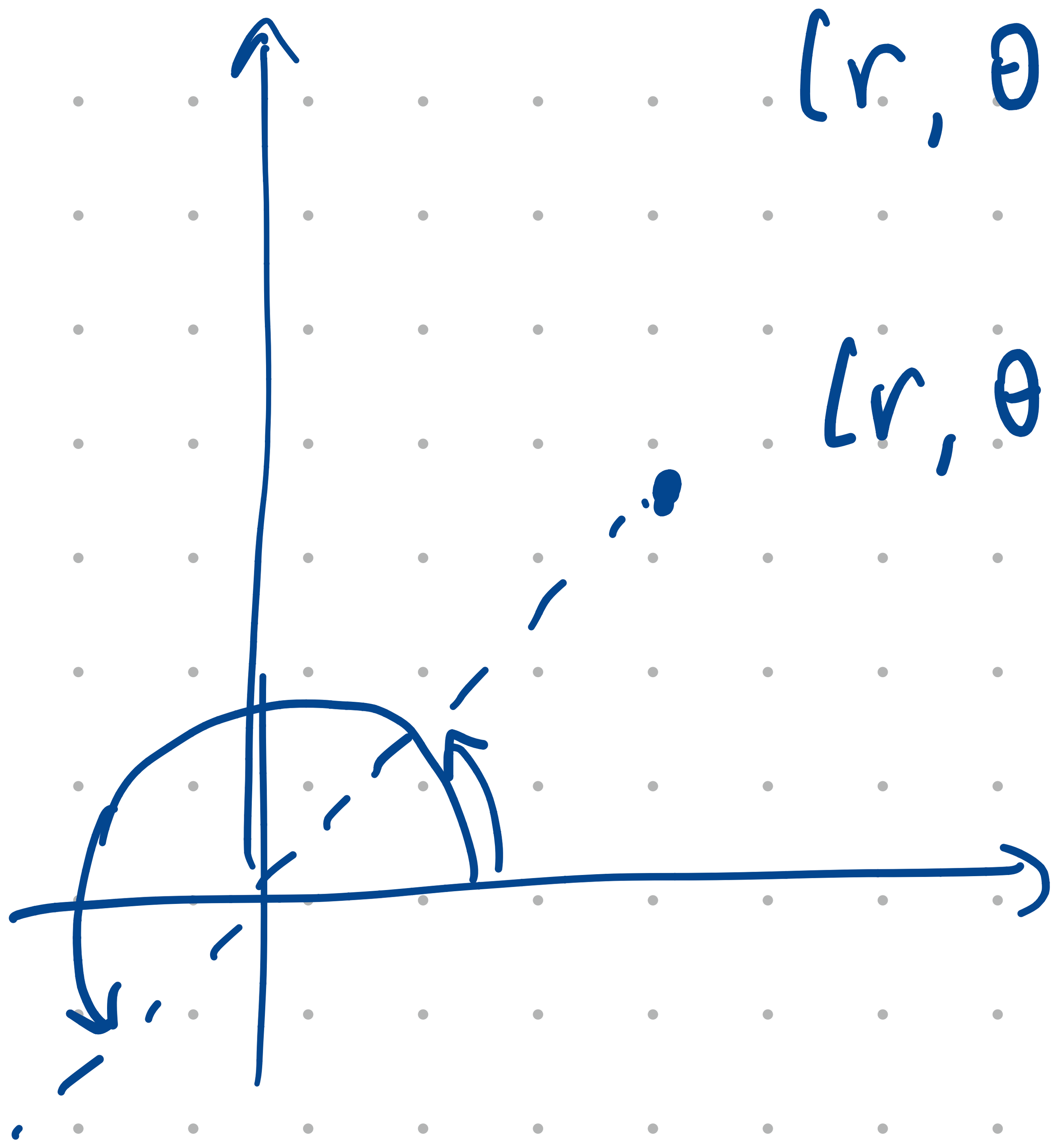


First comment:

The answer must be a multiple of π

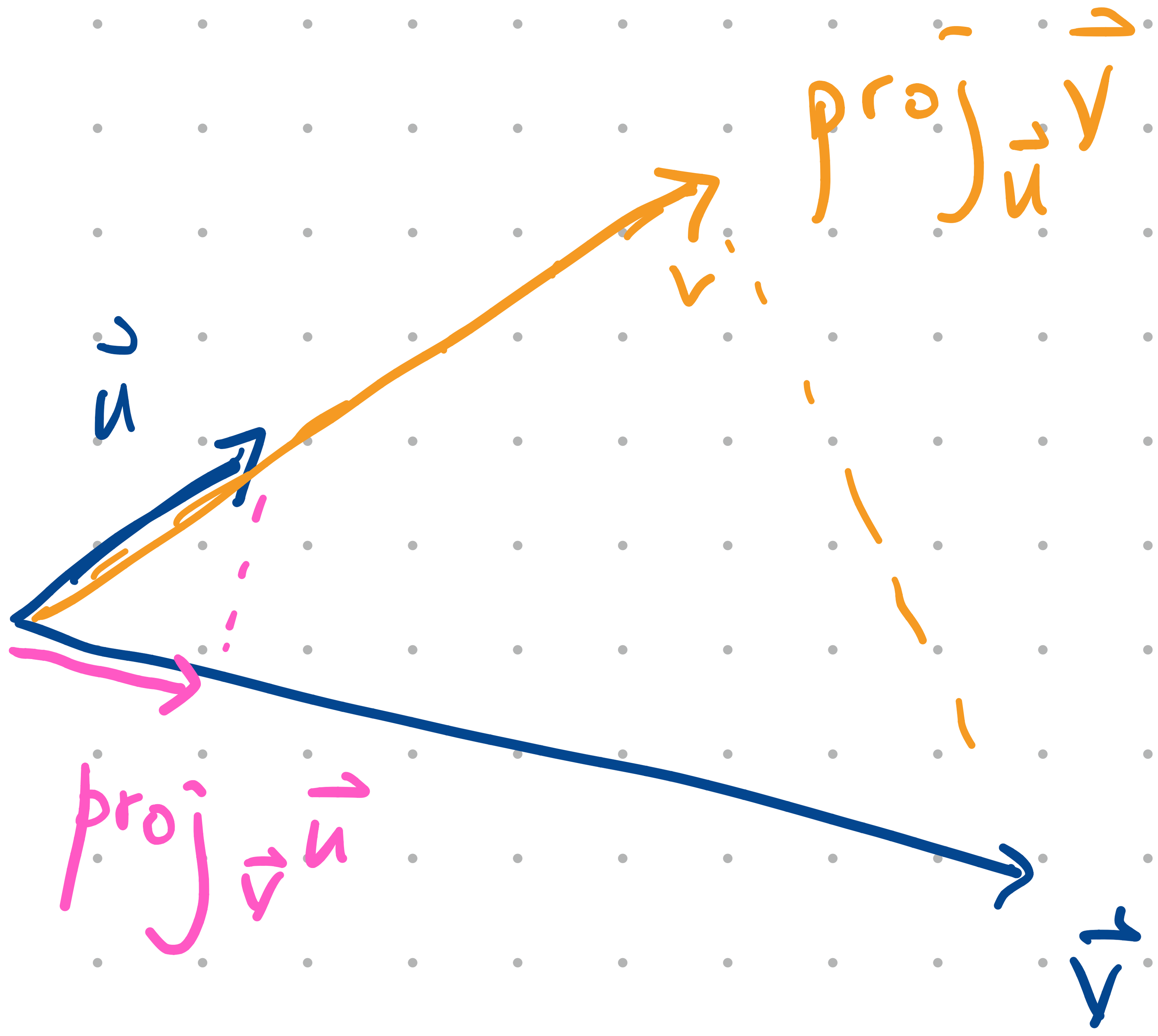
(r, θ) is the same pt. as $(r, \theta + 2\pi)$ — any even mult. of π

(r, θ) is the same pt as $(-r, \theta + \pi)$ — any odd mult of π



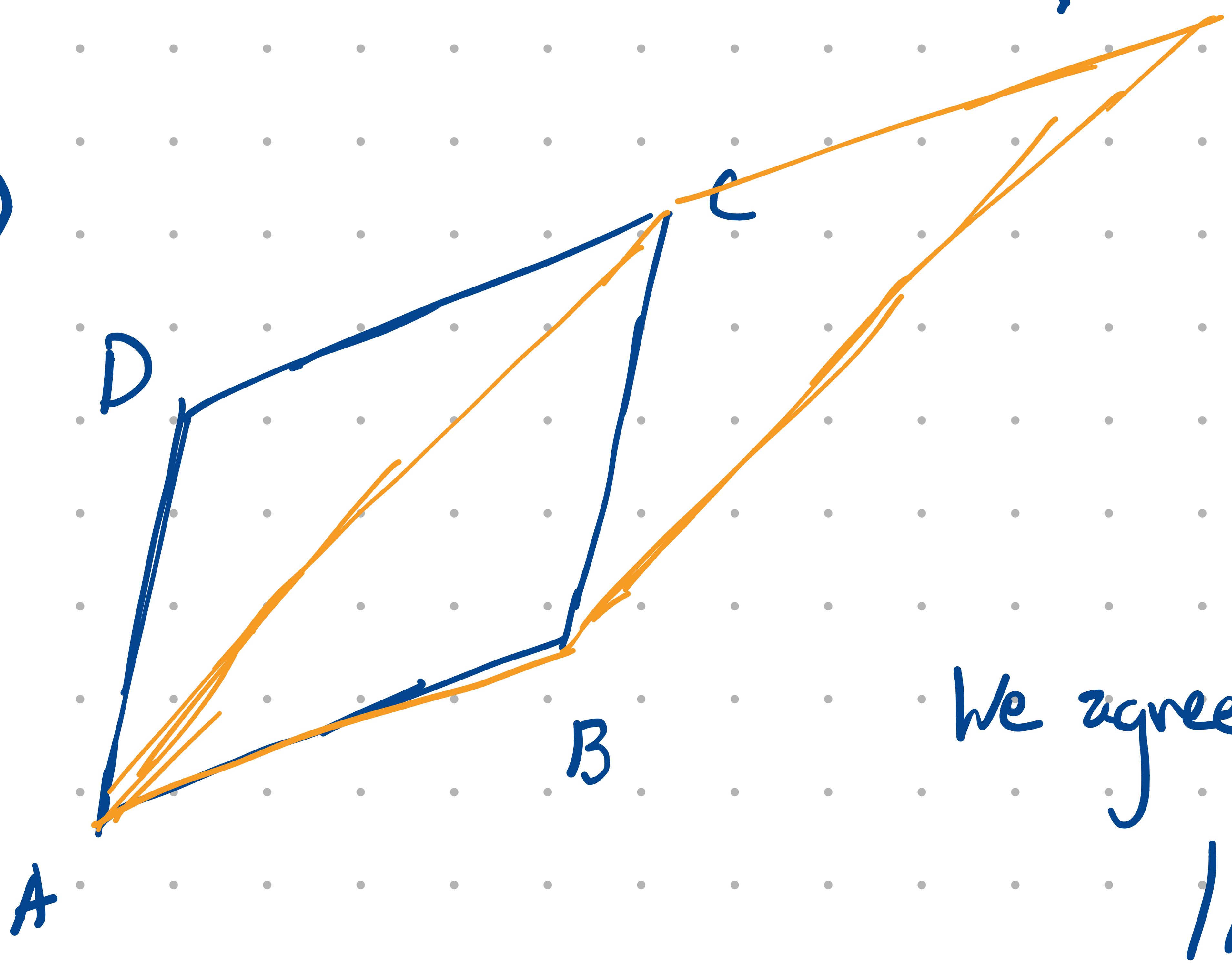
#4) $\vec{u} \cdot \vec{v}$ is a scalar and is 0 when $\vec{u}, \vec{v}$ perpendicular.

#5)



(None of the above)

#6)



We agree that $|\vec{AB}\times\vec{AD}|$ gives area of ▱.

But actually,

So does $|\vec{AB}\times\vec{AC}|$ for example.

1) can see this geometrically or

2) verify algebraically:

$$|\vec{AB}\times(\vec{AD}+\vec{DC})| = |\vec{AB}\times\vec{AD} + \overbrace{\vec{AB}\times\vec{DC}}^{=0}|$$

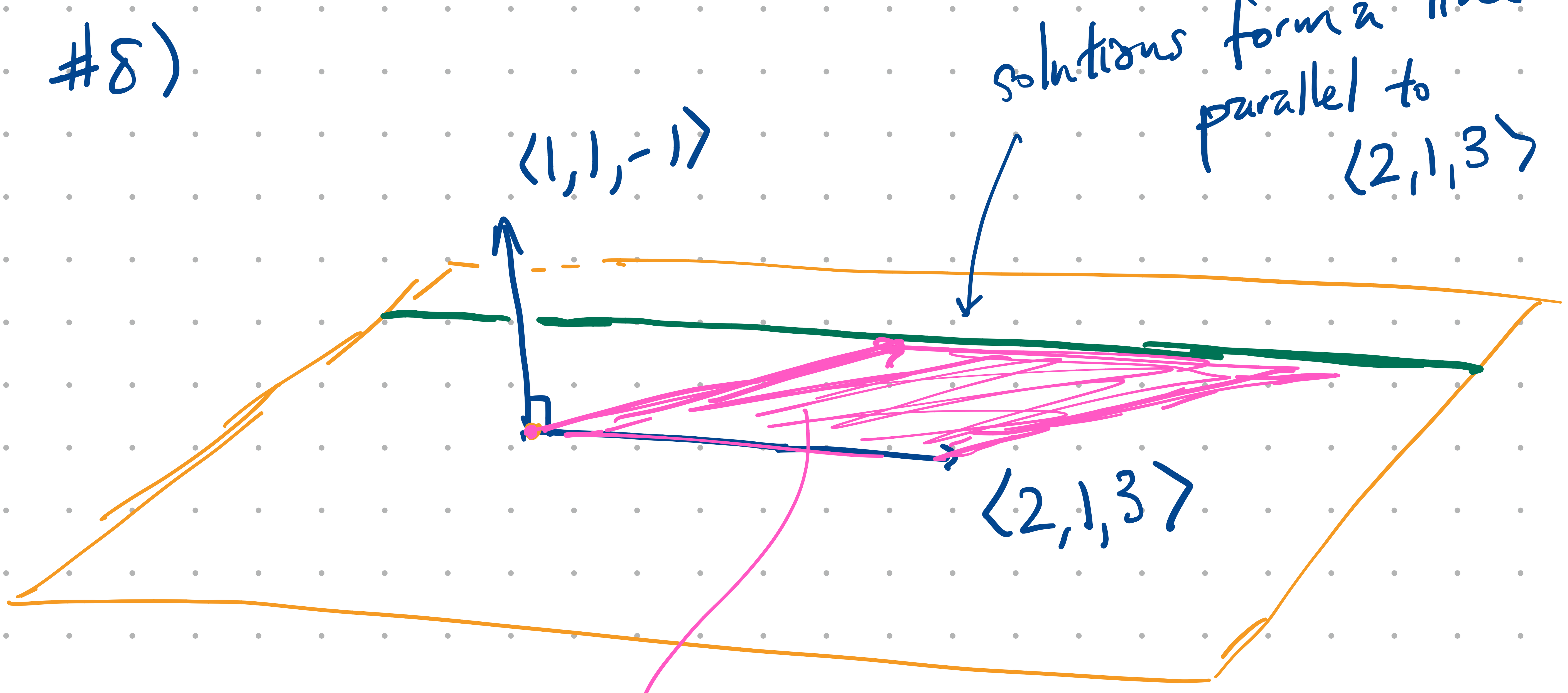
(All three answer choices work)

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)



Area $= |\langle 1,1,-1\rangle|$