# Dot Products

combination of 2 vector magnitudes and the angle between them.

- Dot product of ⊥ vectors is always zero

p429 Box

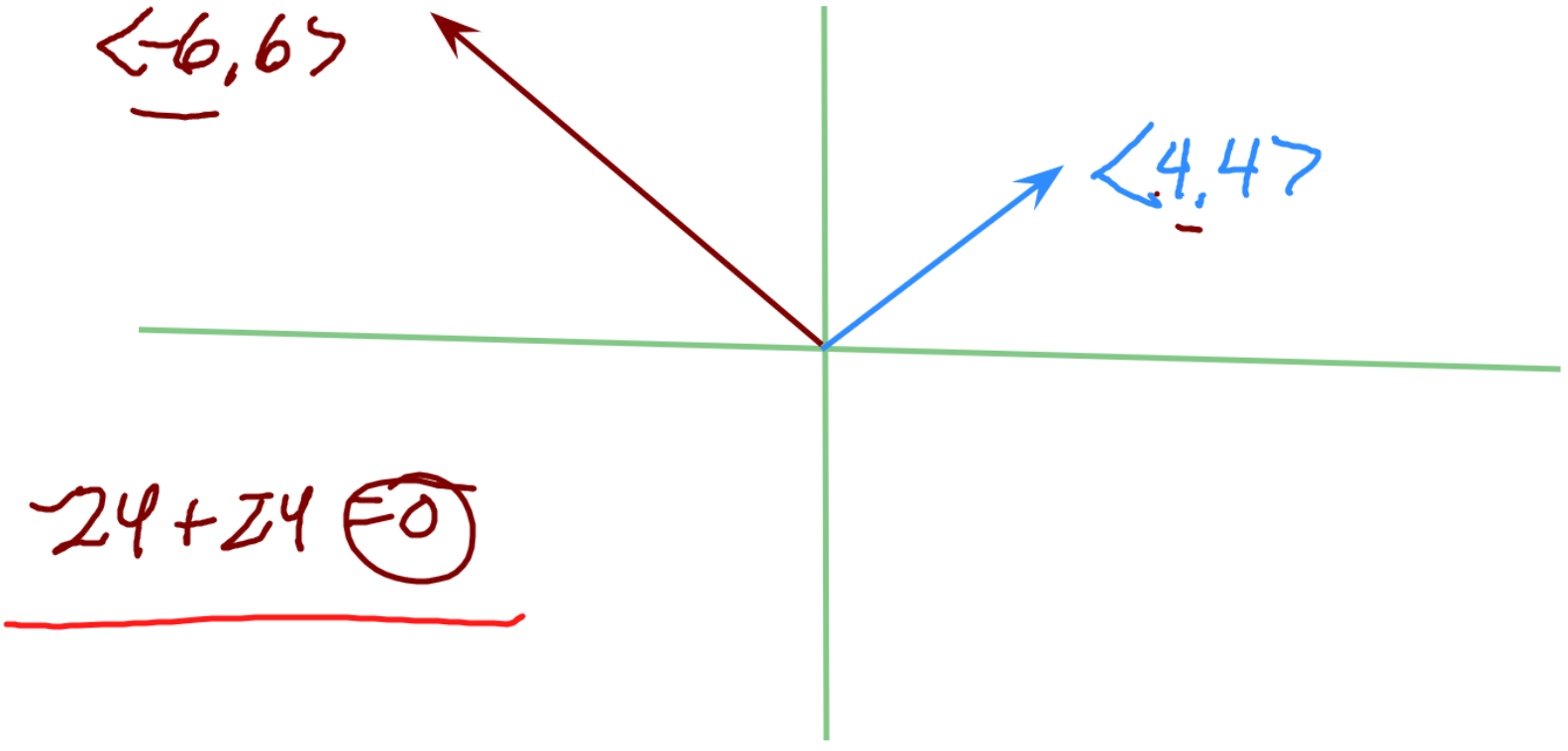
$u = \langle a, b \rangle \qquad ai + bj$

$v = \langle c, d \rangle$

$$u \cdot v = ac + bd$$

$\langle 5, 2 \rangle \cdot \langle 6, -3 \rangle = 5 \cdot 6 + 2(-3) = 30 - 6 = 24$

$\langle -1, -7 \rangle \cdot \langle 5, 2 \rangle = -19$




$-2y+2y=0$

$$\cos\theta = \frac{u \cdot v}{\|u\| \cdot \|v\|}$$

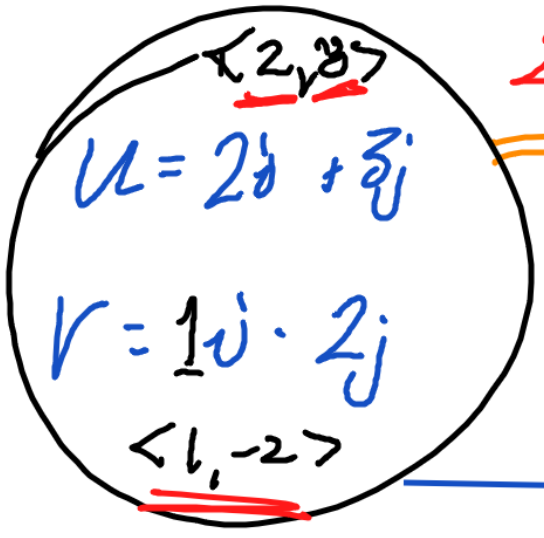
$$u \cdot v = \|u\| \cdot \|v\| \cdot \cos\theta$$

$5 \cdot 5 \cdot 1$

$v \cdot v = \|v\|^2$

$25 = 25$

$\langle 3,4 \rangle \cdot \langle 3,4 \rangle$




$u = 2j + 3j$

$v = 1i \cdot 2j$

$\langle 1, -2 \rangle$

$2^2 + 3^2 = c^2$

$13 = c^2$

$1^2 + (-2)^2 = c^2$

$5 = c^2$

2-6

$$\cos\theta = \frac{u \cdot v}{\|u\| \cdot \|v\|} = \frac{-4}{\sqrt{13}\sqrt{5}}$$

$$\cos\theta = \frac{-4}{\sqrt{65}} \Rightarrow \theta =$$

$$\theta = \cos^{-1}\left(\frac{-4}{\sqrt{65}}\right) = 119.74^\circ$$

6.4 p435 7-12, 23, 25, 29, 33, 38..39,

41, 47, 48, 51, 53