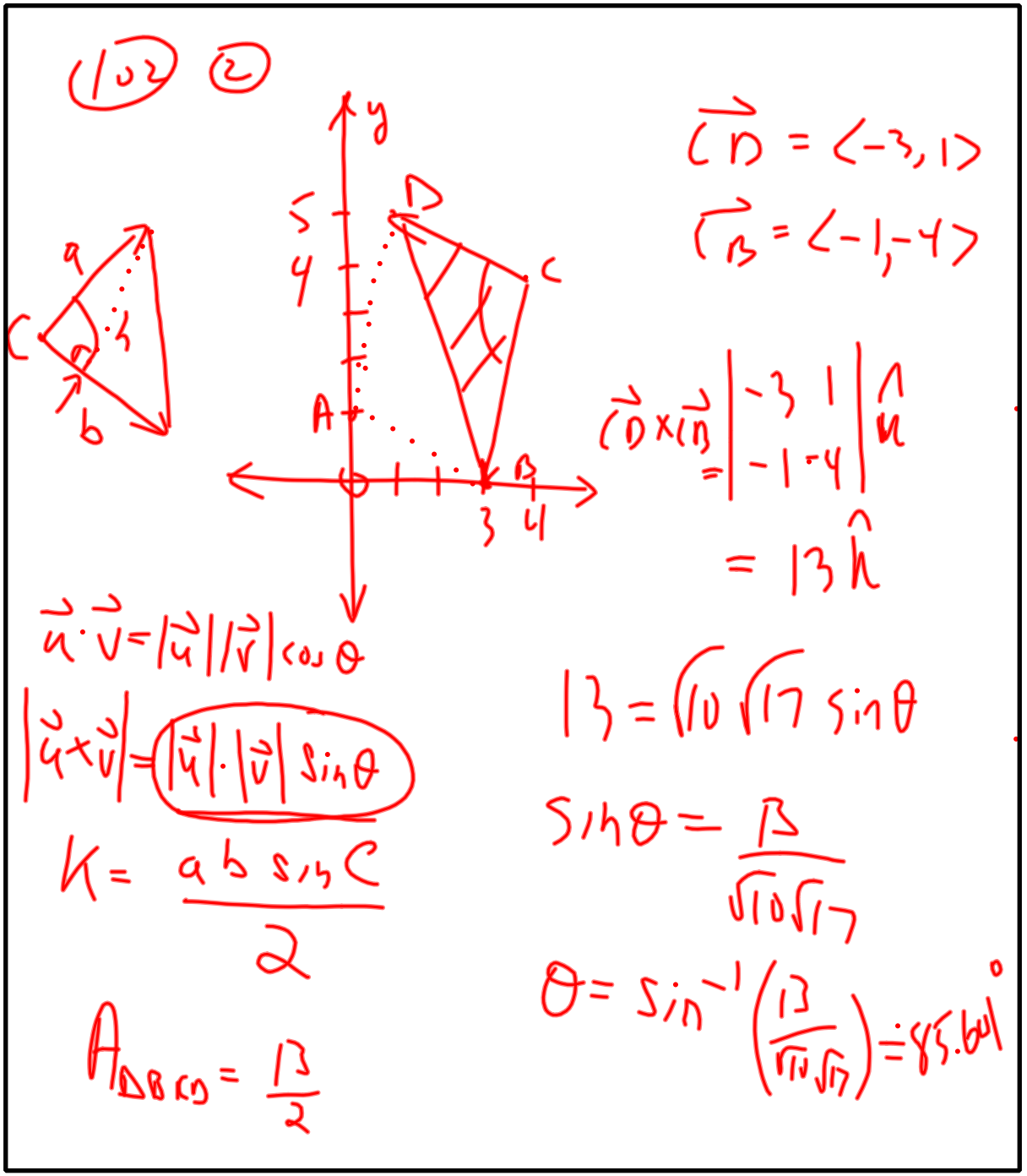

(102) (2)
y
x
D
C
A
B
3
4
a
b
C
$\vec{D} = \langle -3, 1 \rangle$
$\vec{B} = \langle -1, -4 \rangle$
$\vec{D} \times \vec{B} = \begin{vmatrix} -3 & 1 \\ -1 & -4 \end{vmatrix} \hat{k}$
$= 13\hat{k}$
$\vec{u} \cdot \vec{v} = |\vec{u}||\vec{v}| \cos\theta$
$|\vec{u} \times \vec{v}| = |\vec{u}| \cdot |\vec{v}| \sin\theta$
$K = \frac{ab \sin C}{2}$
$A_{DBCD} = \frac{13}{2}$
$13 = \sqrt{10}\sqrt{17} \sin\theta$
$\sin\theta = \frac{13}{\sqrt{10}\sqrt{17}}$
$\theta = \sin^{-1}\left(\frac{13}{\sqrt{10}\sqrt{17}}\right) \approx 85.6^\circ$

③ $\vec{u} = \langle 1, 2, 3 \rangle$

$\vec{v} = \langle 0, -2, 5 \rangle$

$\vec{w} = \langle 1, 1, 0 \rangle$

$$\vec{v} \times \vec{w} = \begin{vmatrix} \hat{i} & \hat{j} & \hat{k} \\ 0 & -2 & 5 \\ 1 & 1 & 0 \end{vmatrix}$$

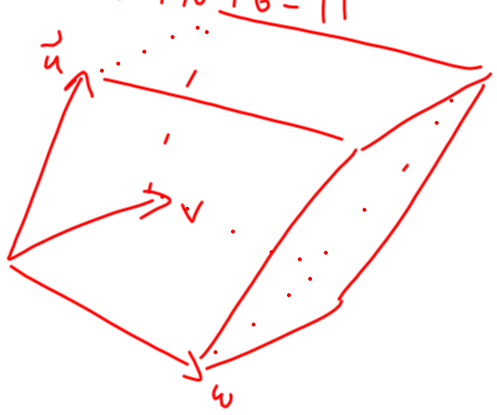
$|\vec{v} \times \vec{w}| = |\langle -5, 5, 2 \rangle| = \sqrt{54}$

$= (0 - 5)\hat{i} - (0 - 5)\hat{j} + (0 + 2)\hat{k}$

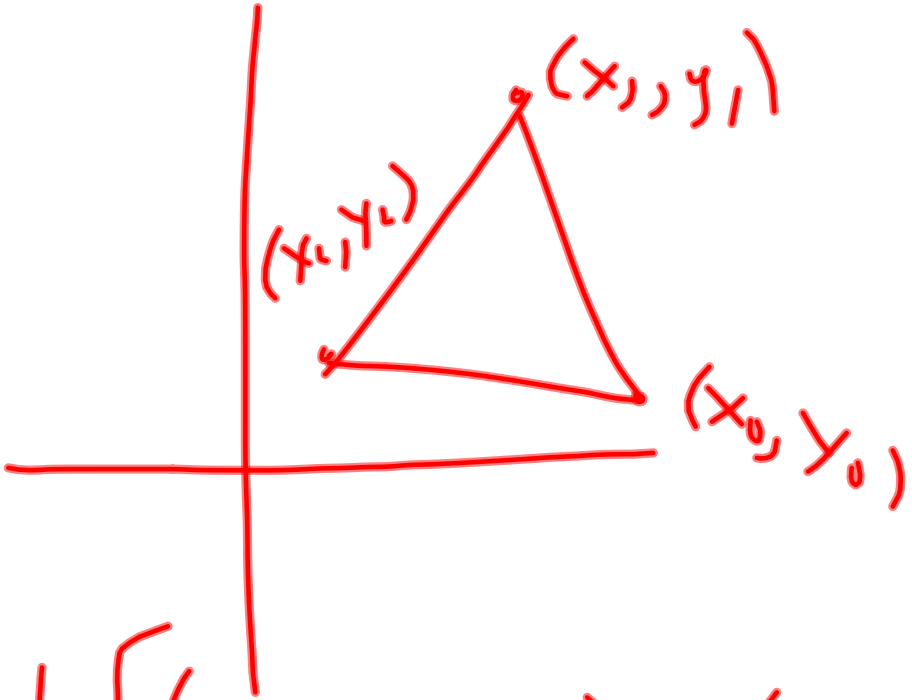
$= \langle -5, 5, 2 \rangle$

$\vec{u} \cdot (\vec{v} \times \vec{w}) = \langle 1, 2, 3 \rangle \cdot \langle -5, 5, 2 \rangle$

$= -5 + 10 + 6 = 11$

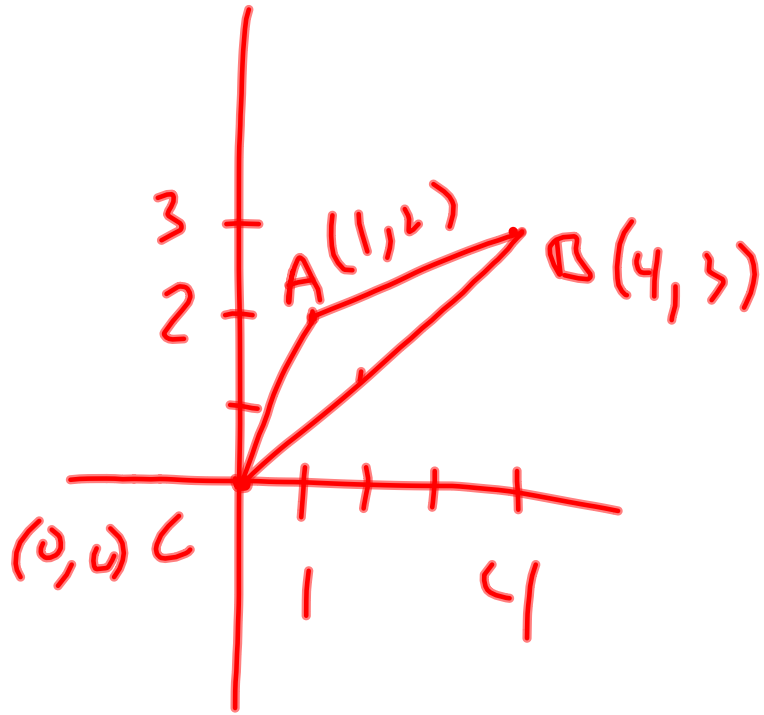


④



$$A = \frac{1}{2} \sum_{i=0}^{2} x_i y_{i+1} - y_i x_{i+1}$$

$$\frac{1}{2}\left[(x_0 y_1 - y_0 x_1) + (x_1 y_2 - y_1 x_2) + (x_2 y_0 - y_2 x_0)\right]$$



$$AB = \sqrt{9+1} = \sqrt{10}$$

$$BC = \sqrt{16+9} = 5$$

$$AC = \sqrt{1+4} = \sqrt{5}$$

$$A = \sqrt{s(s-a)(s-b)(s-c)} = 2.5$$