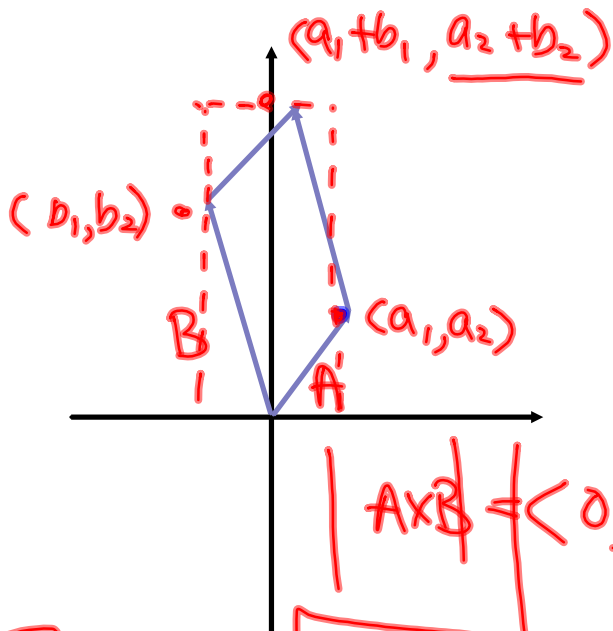




$$|A \times B| = |A||B|\sin\theta$$

$$A = \langle a_1, a_2 \rangle = \langle a_1, a_2, 0 \rangle$$

$$B = \langle b_1, b_2 \rangle = \langle b_1, b_2, 0 \rangle$$

$$|A \times B| = \langle 0, 0, a_1b_2 - a_2b_1 \rangle$$

$$|A \times B| = \sqrt{0^2 + 0^2 + (a_1b_2 - a_2b_1)^2} = |a_1b_2 - a_2b_1|$$

$$= (a_2 + b_2)(a_1 - b_1) + \frac{1}{2}b_1b_2 - \frac{1}{2}a_1a_2 + \frac{1}{2}a_1a_2 + \frac{1}{2}b_1b_2$$

$$= -a_2b_1 + a_1b_2$$

$$A(1, 2, 3)$$

$$B(6, -2, 0)$$

$$C(0, 0, 2)$$

Find the area of $\triangle ABC$. $= \boxed{\sqrt{66}}$

$$\vec{AB} = \langle 5, -4, -3 \rangle$$

$$\vec{AB} \times \vec{AC} = \langle -2, 8, -14 \rangle$$

$$\vec{AC} = \langle -1, -2, -1 \rangle$$

$$\begin{aligned} |\vec{AB} \times \vec{AC}| &= \sqrt{264} \\ &= 2\sqrt{66} \end{aligned}$$