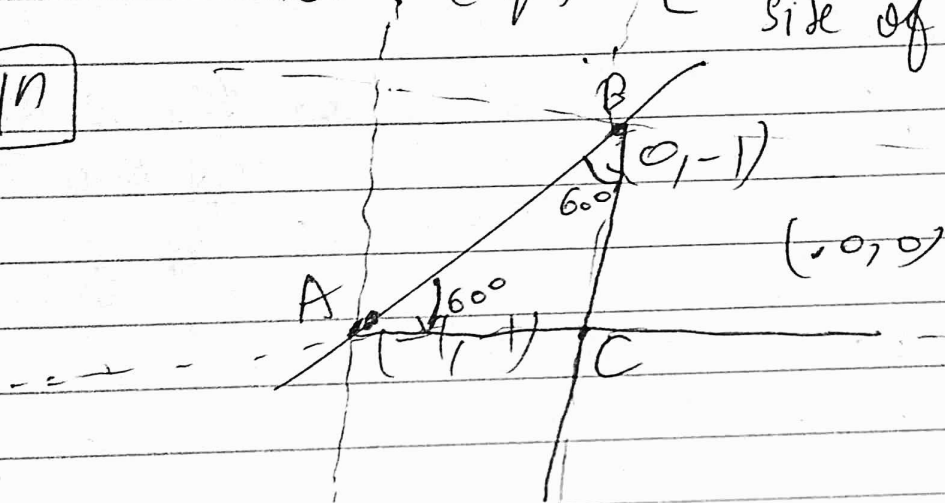


Q2 If a side of an equilateral triangle lies along  $x+y+1=0$  and 2 of the vertices are  $(-1, -1)$  and  $(0, -1)$ . Find the other 2 sides (eqn). [Given 3<sup>rd</sup> vertex lies on the side of  $(0, 0)$ ]

Soln



To find AC

Rotate  $x+y+1$  about  $(-1, -1)$  by  $60^\circ$  clockwise

$$a+bi = (1+i) e^{-i\frac{\pi}{3}} = \frac{(1+i) \times (\frac{1}{2} - \frac{\sqrt{3}}{2}i)}{2}$$

$$= \left(\frac{1+\sqrt{3}}{2}\right) + \left(\frac{1-\sqrt{3}}{2}\right)i$$

Eqn of AC

$$\boxed{(1+\sqrt{3})(x+1) + (1-\sqrt{3})(y+1) = 0}$$

Similarly for BC

Rotate  $x+y+1$  about  $(0, -1)$  by  $60^\circ$  anticlockwise

$$a''+b''i = (1+i) e^{i\frac{\pi}{3}} = \left(\frac{1-\sqrt{3}}{2}\right) + \left(\frac{1+\sqrt{3}}{2}\right)i$$

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Eq<sup>n</sup> of BC

$$(1 - \sqrt{3})(x - 0) + (1 + \sqrt{3})(y + 1) = 0$$