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$$\alpha) \Delta = (a^2+1)^2 - 4a^2 = (a^2+1+2a)(a^2+1-2a) \\ = (a+1)^2 \cdot (a-1)^2 \geq 0$$

$$\beta) S = \frac{a^2+1}{a} \quad P = \frac{a}{a} = 1$$

$$\delta) \begin{cases} a < 0 \Rightarrow S < 0 \\ P = 1 > 0 \end{cases} \left. \vphantom{\begin{matrix} a < 0 \\ P = 1 \end{matrix}} \right\} 2 \text{ roots opposite}$$

$$(ii) |x_1+x_2| \geq 2x_1x_2 \Leftrightarrow$$

$$\frac{a^2+1}{|a|} \geq 2 \Leftrightarrow a^2+1 \geq 2|a|$$

$$|a|^2 - 2|a| + 1 \geq 0 \Leftrightarrow (|a|-1)^2 \geq 0$$

1	1
1	1
1	1
1	1
1	1