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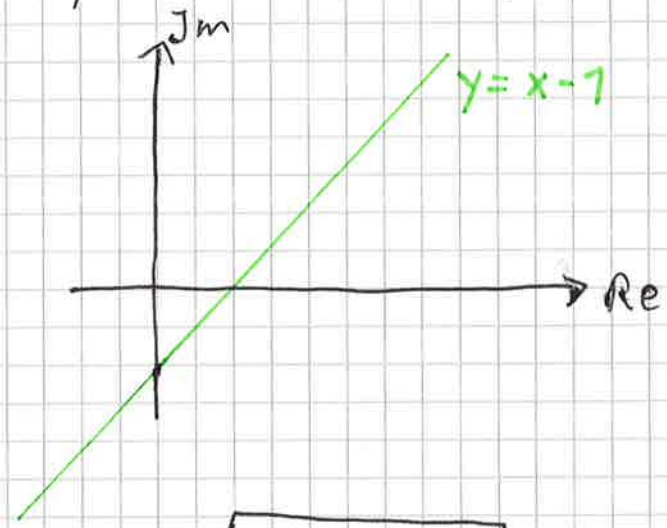
$$a) \left| \frac{z-1-i}{z-2} \right| = \frac{|z-1-i|}{|z-2|} = \frac{\sqrt{(x-1)^2 + (y-1)^2}}{\sqrt{(x-2)^2 + y^2}} \stackrel{!}{=} 1$$

$$\Leftrightarrow \frac{x^2 - 2x + 1 + y^2 - 2y + 1}{x^2 - 4x + 4 + y^2} = 1$$

$$\Leftrightarrow x^2 - 2x + 2 + y^2 - 2y = x^2 - 4x + 4 + y^2$$

$$\Leftrightarrow 2x - 2y = 2$$

$$\Leftrightarrow y = x - 1$$



$$b) |z-1| < \text{Im}(z) + 1 \Leftrightarrow \sqrt{(x-1)^2 + y^2} < y + 1$$

$$\Leftrightarrow x^2 - 2x + 1 + y^2 < y^2 + 2y + 1$$

$$\Leftrightarrow y > \frac{1}{2}x^2 - x$$

