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$$\frac{2}{\log_2 x} + \frac{5}{3 + \log_2 x} \geq 2$$

$$\frac{6 + 2\log_2 x + 5\log_2 x}{\log_2 x (3 + \log_2 x)} - 2 \geq 0$$

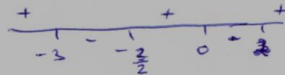
$$\frac{6 + 7\log_2 x - 6\log_2 x - 2\log_2^2 x}{\log_2 x (3 + \log_2 x)} \geq 0$$

$$\frac{2\log_2^2 x - \log_2 x - 6}{\log_2 x (3 + \log_2 x)} \leq 0$$

$$0 \geq \frac{(\log_2 x + 2)(2\log_2 x + 3)}{\log_2 x (3 + \log_2 x)}$$

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$$\begin{aligned} & \boxed{0 < x \neq 1} \\ & 3 + \log_2 x \neq 0 \\ & \log_2 x \neq -3 \\ & \boxed{x \neq \frac{1}{8}} \end{aligned}$$



$$\begin{aligned} -3 < \log_2 x < -\frac{3}{2} & \rightarrow \frac{1}{8} < x \leq \frac{1}{\sqrt{2}} \\ 0 < \log_2 x < 2 & \rightarrow 1 < x \leq 4 \end{aligned}$$