If $\left|\frac{12x}{4x^2+9}\right| \geq 1$ for all real values of x the inequality being satisfied only if $|x|$ is equal to

A) $\frac{3}{2}$

B) $\frac{2}{3}$

C) $\frac{1}{3}$

D) $\frac{1}{2}$

Solution:

[a] $\left|\frac{12x}{4x^2+9}\right| \geq 1 \Rightarrow \frac{12|x|}{4x^2+9} \geq 1 \because 4x^2+9>0 \Rightarrow 4x^2-12|x|+9 \leq 0 \Rightarrow 4|x|^2-12|x|+9 \leq 0$

$\Rightarrow (2|x|-3)^2=0 \Rightarrow |x|=\frac{3}{2}$