

Correction Td Limites-Continuités

Exercice 1

16

$$\begin{aligned}
 \lim_{x \rightarrow +\infty} \frac{\sqrt{3x^2 + 3x + 2}}{2x + 3} &= \begin{cases} \lim_{x \rightarrow +\infty} \sqrt{3x^2 + 3x + 2} = +\infty \\ \lim_{x \rightarrow +\infty} 2x + 3 = +\infty \end{cases} \quad \text{Par quotient, FI} \\
 &= \lim_{x \rightarrow +\infty} \frac{\sqrt{x^2 \left(3 + \frac{3x}{x^2} + \frac{2}{x^2}\right)}}{2x + 3} \\
 &= \lim_{x \rightarrow +\infty} \frac{\sqrt{x^2 \left(3 + \frac{3}{x} + \frac{2}{x^2}\right)}}{2x + 3} \\
 &= \lim_{x \rightarrow +\infty} \frac{\sqrt{x^2} \times \sqrt{\left(3 + \frac{3}{x} + \frac{2}{x^2}\right)}}{2x + 3} \\
 &= \lim_{x \rightarrow +\infty} \frac{|x| \times \sqrt{\left(3 + \frac{3}{x} + \frac{2}{x^2}\right)}}{2x + 3} \\
 &= \lim_{x \rightarrow +\infty} \frac{x \times \sqrt{\left(3 + \frac{3}{x} + \frac{2}{x^2}\right)}}{x \left(2 + \frac{3}{x}\right)} \\
 &= \lim_{x \rightarrow +\infty} \frac{\sqrt{\left(3 + \frac{3}{x} + \frac{2}{x^2}\right)}}{\left(2 + \frac{3}{x}\right)} \\
 &= \frac{\sqrt{3}}{2}
 \end{aligned}$$