

$$\begin{aligned}
 \text{r6. } \lim_{x \rightarrow \infty} \frac{\sqrt{2x^2-4}-3x^3}{\sqrt{x^4+1}} &= \left\{ \frac{\infty}{\infty} \right\} = \left| \frac{\sqrt{x^2(2-\frac{4}{x^2})}-3x^3}{\sqrt{x^4(1+\frac{1}{x^4})}} \right| = \\
 &= \left| \frac{x\sqrt{2}-3x^3}{x^2} \right| = \left| \frac{\cancel{x^3}(\frac{\sqrt{2}}{x^2}-3)}{\cancel{x^2}} \right| = |-3x| = -\infty
 \end{aligned}$$