№6.

$$\lim_{x\to\infty}\frac{\sqrt{2x^2-4}-3x^3}{\sqrt{x^4+1}}=\left\{\frac{\infty}{\infty}\right\}=\Bigg|\ \frac{\sqrt{x^2\left(2-\frac{4}{x^2}\right)}-3x^3}{\sqrt{x^4\left(1+\frac{1}{x^4}\right)}}=$$

$$=\Bigg|\ \frac{x\sqrt{2}-3x^3}{x^2}=\Bigg|\ \frac{x^{\cancel{3}}\left(\frac{\sqrt{2}}{x^2}-3\right)}{\cancel{x^2}}=\Big|-3x=-\infty$$