7.7 1)

$$\lim_{x\to+\infty}\frac{(1-x)(x^2+3)}{x^2+1}=\lim_{x\to+\infty}\frac{x\left(\frac{1}{x}-1\right)\cancel{x^2}\left(1+\frac{3}{x^2}\right)}{\cancel{x^2}\left(1+\frac{1}{x^2}\right)}=\frac{(+\infty)(0-1)(1+0)}{1+0}=(+\infty)(-1)=\boxed{-\infty}$$

7.7 2)

$$\lim_{x\to+\infty}\frac{x^2-5}{(x-2)(x+1)}=\lim_{x\to+\infty}\frac{\cancel{x^2}\left(1-\frac{5}{x^2}\right)}{\cancel{x}\left(1-\frac{2}{x}\right)\cancel{x}\left(1+\frac{1}{x}\right)}=\frac{1-0}{(1-0)(1+0)}=\boxed{1}$$

7.7 3)

$$\lim_{x\to+\infty}\frac{\cancel{x}\left(2-\frac{3}{x}\right)\cancel{x}\left(3+\frac{5}{x}\right)\cancel{x}\left(4-\frac{6}{x}\right)}{\cancel{x^3}\left(3+\frac{1}{x^2}-\frac{1}{x^3}\right)}=\frac{(2-0)(3+0)(4-0)}{3+0-0}=\frac{24}{3}=\boxed{8}$$

7.7 4)

$$\lim_{x\to+\infty}\frac{(x-1)(2x-2)(x-3)(4x-4)(4x-5)}{(2x-1)^5}=$$

$$=\lim_{x\to+\infty}\frac{\cancel{x}\left(1-\frac{1}{x}\right)\cancel{x}\left(2-\frac{2}{x}\right)\cancel{x}\left(1-\frac{3}{x}\right)\cancel{x}\left(4-\frac{4}{x}\right)\cancel{x}\left(4-\frac{5}{x}\right)}{\cancel{x^5}\left(2-\frac{1}{x}\right)^5}=$$

$$=\frac{(1-0)(2-0)(1-0)(4-0)(4-0)}{(2-0)^5}=\frac{32}{32}=\boxed{1}$$

7.7 5)

$$\lim_{x\to+\infty}\frac{(3x-1)^3(2x+1)^4}{x^7+2}=\lim_{x\to+\infty}\frac{\cancel{x^3}\left(3-\frac{1}{x}\right)^3\cancel{x^4}\left(1+\frac{1}{x}\right)^4}{\cancel{x^7}\left(1+\frac{2}{x^7}\right)}=\frac{(3-0)^3(1+0)^4}{1+0}=3^3\cdot1^4=\boxed{27}$$

7.7 6)

$$\lim_{x\to+\infty}\frac{(x-3)^{37}(4x+1)^{13}}{(2x^2-2)^{25}}=\lim_{x\to+\infty}\frac{x^{37}\left(1-\frac{3}{x}\right)^{37}x^{13}\left(4+\frac{1}{x}\right)^{13}}{(x^2)^{25}\left(2-\frac{2}{x^2}\right)^{25}}=$$

$$=\lim_{x\to+\infty}\frac{\cancel{x^{50}}\left(1-\frac{3}{x}\right)^{37}\left(4+\frac{1}{x}\right)^{13}}{\cancel{x^{50}}\left(2-\frac{2}{x^2}\right)^{25}}=\frac{(1-0)^{37}(4+0)^{13}}{(2-0)^{25}}=\frac{4^{13}}{2^{25}}=\frac{2^{26}}{2^{25}}=\boxed{2}$$