Γ ΛΥΚΕΙΟΥ ΜΕΡΟΣ Α

7.5 1)

α) $$\lim_{x\to-\infty}\frac{2x-5}{x+3}=\lim_{x\to-\infty}\frac{\cancel{x}\left(2-\frac{5}{x}\right)}{\cancel{x}\left(1+\frac{3}{x}\right)}=\frac{2-0}{1+0}=\boxed{2}$$

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

7.5 2)

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

7.5 3)

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

7.5 4)

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

7.5 5)

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

7.5 6)

$$\lim_{x\to-\infty}\frac{x^2+9x-1}{4-5x^2}=\lim_{x\to-\infty}\frac{\cancel{x^2}\left(1+\frac{9}{x}-\frac{1}{x^2}\right)}{\cancel{x^2}\left(\frac{4}{x^2}-5\right)}=\frac{1+0-0}{0-5}=\boxed{-\frac{1}{5}}$$

7.5 7)

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

7.5 8)

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

7.5 9)

$$\lim_{x\to-\infty}\frac{x^4+4x^3-2x^2-5x-1}{-x^4-3x+9}=\lim_{x\to-\infty}\frac{\cancel{x^4}\left(1+\frac{4}{x}-\frac{2}{x^2}-\frac{5}{x^3}-\frac{1}{x^4}\right)}{\cancel{x^4}\left(-1-\frac{1}{x^3}+\frac{9}{x^4}\right)}=\frac{1+0-0-0-0}{-1-0+0}=\boxed{-1}$$