Γ ΛΥΚΕΙΟΥ ΜΕΡΟΣ Α

7.3 1)

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

β) $$\lim_{x\to-\infty}\frac{-2x^5-5x^3+4}{3x^3+x^2-x+7}=\lim_{x\to-\infty}\frac{x^{\cancel{5}2}\left(-2-\frac{5}{x^2}+\frac{4}{x^5}\right)}{\cancel{x^3}\left(3+\frac{1}{x}-\frac{1}{x^2}+\frac{7}{x^3}\right)}=(-\infty)\frac{-2-0+0}{3+0-0+0}=\boxed{-\infty}$$

7.3 2)

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

7.3 3)

$$\lim_{x\to+\infty}\frac{9x^4-2x^3+7}{x^2-x+1}=\lim_{x\to+\infty}\frac{x^{\cancel{4}2}\left(9-\frac{2}{x}+\frac{7}{x^4}\right)}{\cancel{x^2}\left(1-\frac{1}{x}+\frac{1}{x^2}\right)}=\frac{(+\infty)(9-0+0)}{1-0+0}=\boxed{+\infty}$$

7.3 4)

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

7.3 5)

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

7.3 6)

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

7.3 7)

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