Câu 2: Tìm các giới hạn sau:

a). $\lim\limits_{x\to-\infty}\left(\sqrt{2x^2+1}+x\right)$ b). $\lim\limits_{x\to+\infty}\frac{3x^2-x+3}{x-4}$ c). $\lim\limits_{x\to+\infty}\frac{x^4-x^3+11}{2x-7}$

d). $\lim\limits_{x\to+\infty}\frac{\sqrt{2x^4+x^2-1}}{1-2x}$ e). $\lim\limits_{x\to+\infty}\frac{\sqrt{x^4-x}}{1-2x}$ f). $\lim\limits_{x\to-\infty}\frac{2x^4+7x^3-15}{x^4+1}$.

LỜI GIẢI

a). $\lim\limits_{x\to-\infty}\left(\sqrt{2x^2+1}+x\right)=\lim\limits_{x\to-\infty}\left(\sqrt{x^2\left(2+\frac{1}{x^2}\right)}+x\right)=\lim\limits_{x\to-\infty}\left(\sqrt{2x^2}+x\right)$

$=\lim\limits_{x\to\infty}\left(|x|\sqrt{2}+x\right)=\lim\limits_{x\to-\infty}\left(-\sqrt{2}x+x\right)=\lim\limits_{x\to-\infty}x\left(-\sqrt{2}+1\right)=+\infty$

b). $\lim\limits_{x\to+\infty}\frac{3x^2-x+3}{x-4}=\lim\limits_{x\to+\infty}\frac{x^2\left(3-\frac{1}{x}+\frac{3}{x^2}\right)}{x\left(1-\frac{1}{x}\right)}=\lim\limits_{x\to+\infty}3x=+\infty$

c). $\lim\limits_{x\to+\infty}\frac{x^4-x^3+11}{2x-7}=\lim\limits_{x\to+\infty}\frac{x^4\left(1-\frac{1}{x}+\frac{11}{x^3}\right)}{x\left(2-\frac{7}{x}\right)}=\lim\limits_{x\to+\infty}\frac{1}{2}x^3=+\infty$

d). $\lim\limits_{x\to+\infty}\frac{\sqrt{2x^4+x^2-1}}{1-2x}=\lim\limits_{x\to+\infty}\frac{\sqrt{x^4\left(2+\frac{1}{x^2}-\frac{1}{x^4}\right)}}{x\left(\frac{1}{x}-2\right)}=\lim\limits_{x\to+\infty}\frac{x\sqrt{2+\frac{1}{x^2}-\frac{1}{x^4}}}{\frac{1}{x}-2}=\lim\limits_{x\to+\infty}\frac{\sqrt{2}x}{-2}=-\infty$

e). $\lim\limits_{x\to+\infty}\frac{\sqrt{x^4-x}}{1-2x}=\lim\limits_{x\to+\infty}\frac{\sqrt{x^4\left(1-\frac{1}{x^3}\right)}}{x\left(\frac{1}{x}-2\right)}=\lim\limits_{x\to+\infty}\frac{x\sqrt{1-\frac{1}{x^3}}}{\frac{1}{x}-2}=+\infty$

f). $\lim\limits_{x\to-\infty}\frac{2x^4+7x^3-15}{x^4+1}=\lim\limits_{x\to-\infty}\frac{x^4\left(2+\frac{7}{x}-\frac{15}{x^3}\right)}{x^4\left(1+\frac{1}{x^4}\right)}=2$