7.11 1)

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

$=\lim\limits_{x\to+\infty}|x|\sqrt{2-\frac{1}{x}+\frac{2}{x^2}}\overset{\text{κοντά στο }+\infty}{\underset{x>0\Rightarrow|x|=x}{=}}\lim\limits_{x\to+\infty}x\sqrt{2-\frac{1}{x}+\frac{2}{x^2}}=(+\infty)\sqrt{2-0+0}=\boxed{+\infty}$

β) $\lim\limits_{x\to-\infty}\sqrt{x^2+2x-7}=\lim\limits_{x\to-\infty}\sqrt{x^2\left(1+\frac{2}{x}-\frac{7}{x^2}\right)}=\lim\limits_{x\to-\infty}\sqrt{x^2}\sqrt{1+\frac{2}{x}-\frac{7}{x^2}}=$

$=\lim\limits_{x\to-\infty}|x|\sqrt{1+\frac{2}{x}-\frac{7}{x^2}}\overset{\text{κοντά στο }-\infty}{\underset{x<0\Rightarrow|x|=-x}{=}}\lim\limits_{x\to+\infty}\left(-x\sqrt{1+\frac{2}{x}-\frac{7}{x^2}}\right)=(+\infty)\sqrt{1+0-0}=\boxed{+\infty}$

7.11 2)

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

$=\lim\limits_{x\to+\infty}\left(|x|\sqrt{1+\frac{1}{x}-\frac{3}{x^2}}\right)\overset{|x|=x}{\underset{x>0}{=}}\lim\limits_{x\to+\infty}\left(x\sqrt{1+\frac{1}{x}-\frac{3}{x^2}}\right)=(+\infty)\sqrt{1+0-0}=\boxed{+\infty}$

7.11 3)

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

$=\lim\limits_{x\to-\infty}\left(|x|\sqrt{4-\frac{2}{x}+\frac{1}{x^2}}\right)\overset{|x|=-x}{\underset{x<0}{=}}\lim\limits_{x\to-\infty}\left(-x\sqrt{4-\frac{2}{x}+\frac{1}{x^2}}\right)=(+\infty)\sqrt{4-0+0}=\boxed{+\infty}$

7.11 4)

$\lim\limits_{x\to+\infty}\sqrt{2x^3-5x^2+6}=\lim\limits_{x\to+\infty}\sqrt{x^3\left(2-\frac{5}{x}+\frac{6}{x^3}\right)}=\lim\limits_{x\to+\infty}\sqrt{x^3}\sqrt{2-\frac{5}{x}+\frac{6}{x^3}}=$

$=(+\infty)\sqrt{2-0+0}=\boxed{+\infty}$