Д/З.

47, 49, 50, 51, 52, 58, 61, 63, 55, 56, 65, 67, 70

**1.47**

$$\lim_{n\to\infty}\frac{3n^2-2n-1}{n^2-11n+9}=\frac{\lim\limits_{n\to\infty}3n^2-2n-1}{\lim\limits_{n\to\infty}n^2-11n+9}=\frac{+\infty}{+\infty}\Rightarrow$$

$\Rightarrow$ при таком виде неопределен $\Rightarrow$ делим числитель и зн. на самую „сильную функцию".

$$\lim_{n\to\infty}=\frac{3-\cancel{\frac{2}{n}}^{\to 0}-\cancel{\frac{1}{n^2}}^{\to 0}}{1-\cancel{\frac{11}{n}}^{\to 0}+\cancel{\frac{9}{n^2}}^{\to 0}}=\frac{3}{1}=3$$

**1.49**

$$\lim_{n\to\infty}\frac{\sqrt{4n^2-3n+5}}{n+3}=\left[\frac{\infty}{\infty}\right]=$$

$$\lim_{n\to\infty}\frac{\sqrt{4-\cancel{\frac{3}{n}}^{\to 0}+\cancel{\frac{5}{n^2}}^{\to 0}}}{1+\cancel{\frac{3}{\sqrt{n^2}}}^{\to 0}}=2$$

**1.50**

$$\lim_{n\to\infty}(2n^2-n+1)=+\infty$$

**1.51**

$$\lim_{n\to\infty}(-5n^2+2n+3)=-\infty$$

1.52

$$\lim_{n\to\infty} \frac{3\cdot 5^n+2}{5^n+1} = \left[\frac{\infty}{\infty}\right] = \lim_{n\to\infty} \frac{3+\cancel{\frac{2}{5^n}}^{\,0}}{1+\cancel{\frac{1}{5^n}}^{\,0}} =$$

$$= 3$$

1.61

$$\lim_{n\to\infty} \frac{\overset{1}{(2n-3)^7}}{\underset{2}{(4n+\sqrt{n})^3}\,\underset{2}{(n^4+2n^3\sin 2n)}}$$

1 $(2n-3)^7 \approx (2n)^7 = 2^7\cdot n^7$

2 $(4n+\sqrt{n})^3 \sim (4n)^3 \approx 4^3\cdot n^3$

3 $n^4+2n^3\cdot\sin 2n \approx n^4$, т.к

$$\lim_{n\to\infty} \frac{2^7\cdot n^7}{4^3\cdot n^7} =$$

1.58

$$\lim_{n\to\infty} \frac{\overset{\approx 3^n}{3^{n+2}} + \overset{\approx \ln(n)}{\ln(n^7+1)} + 3n^6}{\underset{\sqrt[3]{4n}}{\sqrt[3]{4n+5}} + 3\lg n - 3^n} = \lim_{n\to\infty} \frac{3^n+7\ln(n)+3n^6}{\sqrt[3]{4n}+3\lg(n)-3^n} \approx$$

$$\approx \lim_{n\to\infty} \frac{3^n}{-3^n} = -1$$

$$\lim_{n\to\infty}\left(1-\frac{1}{n}\right)^n = \frac{1}{e}$$

$$\lim_{n\to\infty}\left(1+\frac{1}{n}\right)^n = e$$

1.65

$$\lim_{n\to\infty}\left(1-\frac{1}{2n}\right)^{4n-3} \approx$$

$$\approx \left(e^{-\frac{1}{2n}}\right)^{4n-3} \approx \left(e^{-\frac{1}{2n}}\right)^{4n} = e^{-2}$$

1.55 $\lim\limits_{n\to\infty}\left(\sqrt{n^2-2n+4}-n\right)=\lim\limits_{n\to\infty}\left(\sqrt{n^2-3n+4}\right)=$

$=$ Ծ.Ծ.Կ

1.56 $\lim\limits_{n\to\infty}\left(\sqrt{n^2+4}-n\right)\cancel{\cos(7-12n^3)}=$

$=\lim\limits_{n\to\infty}\cancel{\frac{2}{n}}^{0}\cdot\cancel{\cos(7-12n^3)}^{0}=0$

1.63 $\lim\limits_{n\to\infty}\frac{2n^2+n+1}{1+2+\ldots+n}\approx\lim\limits_{n\to\infty}\frac{2+\cancel{\frac{1}{n}}^{0}+\cancel{\frac{1}{n^2}}^{0}}{\cancel{\frac{1}{n^2}}^{0}+\cancel{\ldots}^{0}+\cancel{\frac{1}{n}}^{0}}=$ Ծ.Ծ.Կ

1.67 $\lim\limits_{n\to\infty}\cancel{(3n+4)}\left(\cancel{\ln(n-5)-\ln n}^{0}\right)=$ Ծ.Մ.Կ

1.70

$\lim\limits_{n\to\infty}\frac{\sin n\sqrt{n}}{n+1}=\frac{\cancel{\frac{\sin n}{n}}^{0}\cdot\cancel{\frac{1}{\sqrt{n}}}^{0}}{1}=0$