

# Limit to Infinity Practice

For all: N = Degree of Numerator  
D = Degree of Denominator

$$1) \lim_{n \rightarrow \infty} \frac{n^2 + 5n - 72}{3n^2} \quad N=D \Rightarrow \boxed{\frac{1}{3}}$$

$$2) \lim_{n \rightarrow \infty} \frac{4n^2}{n} \quad N > D \Rightarrow \boxed{\infty}$$

$$3) \lim_{n \rightarrow \infty} \frac{2n + 5n^3 + 720n^5}{n^5 + 2n^4 + 3n^2} \quad N=D \Rightarrow \boxed{720}$$

$$4) \lim_{n \rightarrow \infty} \frac{2n^2 + n - 27}{2n^2 + n - 27n^5} \quad D > N \Rightarrow \boxed{0}$$

$$5) \lim_{n \rightarrow \infty} \frac{n - 7 + 27n}{27n + n - 7} \quad N=D \Rightarrow \boxed{\frac{-13}{14}}$$

$$6) \lim_{n \rightarrow \infty} \frac{8n^0}{5n^2 + 7} \quad D > N / N < D \Rightarrow \boxed{0}$$

$$7) \lim_{n \rightarrow \infty} \frac{0n^0}{85n^7 + 7} \quad N < D$$

\* Always 0 for  $n^0$   
 $\Rightarrow \boxed{0}$

$$8) \lim_{n \rightarrow \infty} \frac{8 \cdot 7n^2 + 50n^3}{n^3 + 2 \cdot 65n^2} \quad N=D \Rightarrow \boxed{50}$$

$$9) \lim_{n \rightarrow \infty} \frac{50n + 30n + 2 \cdot 5867}{20n + 5n - 2n + 0.87} \quad N=D \Rightarrow \boxed{\frac{80}{23}}$$

$$10) \lim_{n \rightarrow \infty} \frac{8 \cdot 5n^7 + 8 \cdot 5n^8}{n^6 + 5 \cdot 672n^7} \quad N > D \Rightarrow \boxed{\infty}$$

$$11) \lim_{n \rightarrow \infty} \frac{50n^{1.2}}{85n^{7.34}} \quad D > N \Rightarrow \boxed{0}$$

Show Long Way:

$$12) \lim_{n \rightarrow \infty} \frac{8n^3 + 7n^2 + 65n}{7n^3 + 80n^2 + 5n} \left( \frac{\frac{1}{n^3}}{\frac{1}{n^3}} \right)$$

$$\Rightarrow \lim_{n \rightarrow \infty} \frac{8 + \frac{7}{n} + \frac{65}{n^2}}{7 + \frac{80}{n} + \frac{5}{n^2}} \Rightarrow \boxed{\frac{8}{7}}$$