

3.11

- 1) $\lim_{x \rightarrow \infty} \frac{6x^4 - 3x^2 + 2}{x^3 - 27} = \lim_{x \rightarrow \infty} \frac{6x^4}{x^3} = \lim_{x \rightarrow \infty} 6x$
 (a) $\lim_{x \rightarrow -\infty} 6x = -\infty$
 (b) $\lim_{x \rightarrow +\infty} 6x = +\infty$
- 2) $\lim_{x \rightarrow \infty} \frac{8x^5 - 3x^2 + 2x - 3}{32x^5 + 1} = \lim_{x \rightarrow \infty} \frac{8x^5}{32x^5} = \lim_{x \rightarrow \infty} \frac{8}{32} = \frac{8}{32} = \frac{1}{4}$
- 3) $\lim_{x \rightarrow \infty} \frac{3x - 2}{9x + 7} = \lim_{x \rightarrow \infty} \frac{3x}{9x} = \lim_{x \rightarrow \infty} \frac{3}{9} = \frac{3}{9} = \frac{1}{3}$
- 4) $\lim_{x \rightarrow \infty} \frac{6x^2 + 2x + 1}{6x^2 - 3x + 4} = \lim_{x \rightarrow \infty} \frac{6x^2}{6x^2} = \lim_{x \rightarrow \infty} 1 = 1$
- 5) $\lim_{x \rightarrow \infty} \frac{x^2 + x - 2}{4x^3 - 1} = \lim_{x \rightarrow \infty} \frac{x^2}{4x^3} = \lim_{x \rightarrow \infty} \frac{1}{4x} = 0$
- 6) $\lim_{x \rightarrow \infty} \frac{2x^3}{1 - x^2} = \lim_{x \rightarrow \infty} \frac{2x^3}{-x^2} = \lim_{x \rightarrow \infty} -2x$
 (a) $\lim_{x \rightarrow -\infty} -2x = +\infty$
 (b) $\lim_{x \rightarrow +\infty} -2x = -\infty$
- 7) $\lim_{x \rightarrow \infty} \frac{(3x + 4)(x - 1)}{(2x + 7)(1 - 5x)} = \lim_{x \rightarrow \infty} \frac{3x \cdot x}{2x \cdot (-5x)} = \lim_{x \rightarrow \infty} \frac{3x^2}{-10x^2} =$
 $\lim_{x \rightarrow \infty} -\frac{3}{10} = -\frac{3}{10}$
- 8) $\lim_{x \rightarrow \infty} \frac{(x + 1)^7 (2x + 3)^4}{(2x + 1)^3 (x - 98)^8} = \lim_{x \rightarrow \infty} \frac{x^7 \cdot (2x)^4}{(2x)^3 \cdot x^8} = \lim_{x \rightarrow \infty} \frac{16x^{11}}{8x^{11}} =$
 $\lim_{x \rightarrow \infty} \frac{16}{8} = \frac{16}{8} = 2$