THE HONG KONG POLYTECHNIC UNIVERSITY

Department of Applied Mathematics

Lightboard Project

2. Limits Without L'Hopitals' Rule

Evaluate the following limits.

2.1 $\lim\limits_{x\to 1} \dfrac{\sin(x^2)}{3x^2}$ [18192 Exam]

2.2 $\lim\limits_{x\to -1} \dfrac{x^2-2x-3}{x^2-3x-4}$ [20211 Test1]

2.3 $\lim\limits_{x\to 4} \dfrac{x^3-64}{\sqrt{x}-2}$ [15161 Exam]

2.4 $\lim\limits_{x\to 0} \dfrac{\cos x - \cos(2x)}{1-\cos x}$ [16172 Exam]

2.5 $\lim\limits_{x\to 0} \dfrac{\sqrt{e^x+x}-\sqrt{e^x}}{x}$ [16171 Exam]

2.6 $\lim\limits_{x\to \infty} (\sqrt{x}-\sqrt{x-1110})$ [14151 Exam]

2.7 $\lim\limits_{x\to \pi} \dfrac{\sqrt{1-\tan x}-\sqrt{1+\tan x}}{\sin 2x}$ [17182 Exam]

2.8 $\lim\limits_{x\to \infty} \dfrac{3x^2+\frac{1}{x}}{\sqrt{x^4+2x}}$ [16171 Exam]

2.9 $\lim\limits_{x\to \infty} (\sqrt{x^2-10x}-\sqrt{x^2+1})$ [14152 Exam]

2.10 $\lim\limits_{x\to -\infty} \dfrac{x+3}{\sqrt{16x^2-3x}} \sqrt{\dfrac{x^5+9x}{3x^5-2x}}$ [20211 Test1]

2.11 $\lim\limits_{x\to \infty} \dfrac{\sin(2x)}{3x}$ [20211 Test1]

2.12 $\lim\limits_{x\to \infty} \sin(x)\ln(1+\dfrac{3}{x})$ [17181 Exam]

2.13 $\lim_{x\to 0} \cot 5x \sin 6x \cos 7x$ [15162 Exam]

2.14 $\lim_{x\to 0} \frac{(\sin x)^3}{2x^3 + 3x^4}$ [17181 Exam]

2.15 $\lim_{x\to \infty} x^3 \sin(\frac{\pi}{x^3})$ [17182 Exam]