Assignment 3: Using Limits

Problem 1

Solve for the limit algebraically: $\displaystyle\lim_{x \to 2} \frac{x^2 + 7x - 18}{x^3 - 2x^2}$

Problem 2

Use the left and right hand limits to determine $\displaystyle\lim_{x \to 1} f(x)$ where $f(x) = \begin{cases} \sqrt{x} & x > 1 \\ x^2 & x \leq 1 \end{cases}$

Problem 3

Solve for the limit $\displaystyle\lim_{y\to\frac{\pi}{4}} \frac{\cos(2y)}{\cos(y) - \sin(y)}$

Problem 4

Show that $\displaystyle\lim_{x\to 0} \frac{\tan(2x)}{x} = 2$.   Hints: $\displaystyle\lim_{x\to 0} \frac{\sin(x)}{x} = 1$ and $\sin(2x) = 2\sin(x)\cos(x)$.