MATH 2554 : 2.3 Review Sheet

Some Problems From this section I recommend

— Section 2.3 : 22, 23, 25, 36, 37, **40**, **57**, **67**,

Especially important ones in **bold**

Key Concepts

Definition (Limit of a Function) : Suppose the function f is defined for all x near a except possibly at a. If $f(x)$ is arbitrarily close to L (that is, as close to L as we like) for all x sufficiently close (but not equal) to a, we write

$$\lim_{x\to a} f(x) = L$$

For **linear** functions ($f(x) = mx + b$) specifically $\lim_{x\to a} f(x) = f(a) = ma + b$, otherwise you must follow the **Limit Laws**!

— **Sum** $\lim_{x\to a}(f(x) + g(x)) = \lim_{x\to a} f(x) + \lim_{x\to a} g(x)$

— **Constant Multiple** $\lim_{x\to a}(c \cdot f(x)) = c \cdot \lim_{x\to a} f(x)$

— **Product** $\lim_{x\to a}(f(x) \cdot g(x)) = \big(\lim_{x\to a} f(x)\big) \cdot \big(\lim_{x\to a} g(x)\big)$

— **Power** $\lim_{x\to a}(f(x))^n = \big(\lim_{x\to a} f(x)\big)^n$

Might seem straightforward enough, but things get a bit more complicated with the **Quotient** and **Root** laws...

— **Quotient** $\lim_{x\to a}\left(\dfrac{f(x)}{g(x)}\right) = \dfrac{\lim_{x\to a} f(x)}{\lim_{x\to a} g(x)}$ if $\lim_{x\to a} g(x) \neq 0$

— **Root** $\lim_{x\to a}(f(x))^{1/n} = \big(\lim_{x\to a} f(x)\big)^{1/n}$ if $\lim_{x\to a} f(x) > 0$ if n is even.