23 Oct Recitation Worksheet for MA141

1. Determine if the following limits exists, and if they do, find them.
   (a) $\lim_{x\to 2} \frac{x-2}{x^2-4}$
   (b) $\lim_{x\to 0} \frac{\sin 2x}{x}$
   (c) $\lim_{x\to -1} \frac{x^2+2x-1}{x+1}$
   (d) $\lim_{x\to 0} \frac{1-\cos x}{x^2}$
   (e) $\lim_{x\to 0} \left(\frac{1}{x} - \frac{1}{\sqrt[3]{x}}\right)$
2. Evaluate the following:
   (a) $\sum_{i=1}^{5} f(i)$ where $f(x) = x^2$.
   (b) $\sum_{i=0}^{3} f(x_i) * 2$ where $f(x) = 3x + 1$ and $x_0 = 0, x_1 = 2, x_2 = 4, x_3 = 6$.
   (c) $\sum_{i=1}^{n} 1$
   (d) $\sum_{i=1}^{n} i$
   (e) $\sum_{i=1}^{n} i^2$
   (f) $\sum_{i=1}^{10} f(i)$ where $f(x) = x^2 + 2x$.
   (g) $\sum_{i=1}^{10} f(i)$ where $f(x) = \frac{x^2}{2} + 7$
3. Classify all functions that satisfy the following:
   (a) $f' = 2x + 1$
   (b) $g' = \cos(x)$
   (c) $f' = 5/x$
   (d) $g' = 11x^3 + 4x^2 - 5x$
   (e) $f' = 4x + 6x^2 + 5x^4$ and $f(0) = 5$.
   (f) $h' = \frac{\sin(x)+5x}{2}$ and $h(0) = 0$.