

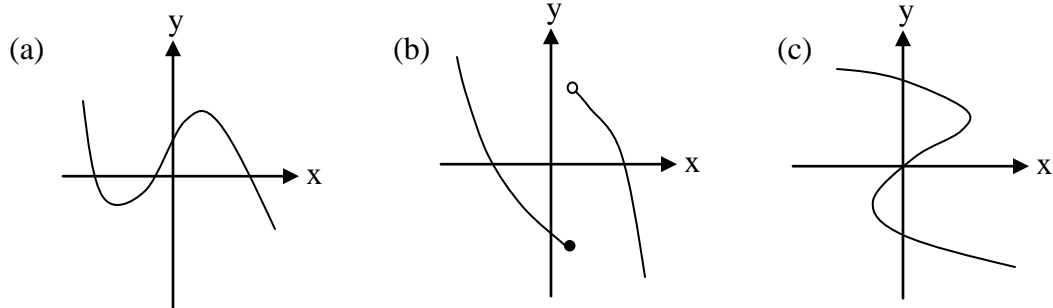
Assignment 1

MATH 1500

(Follows Unit 4 in the manual)

Values

- [6] 1. Determine which of the following graphs is the graph of a function of the type $y = f(x)$. Give reasons for your answers.



- [9] 2. For each of the following functions, find the domain and the range.

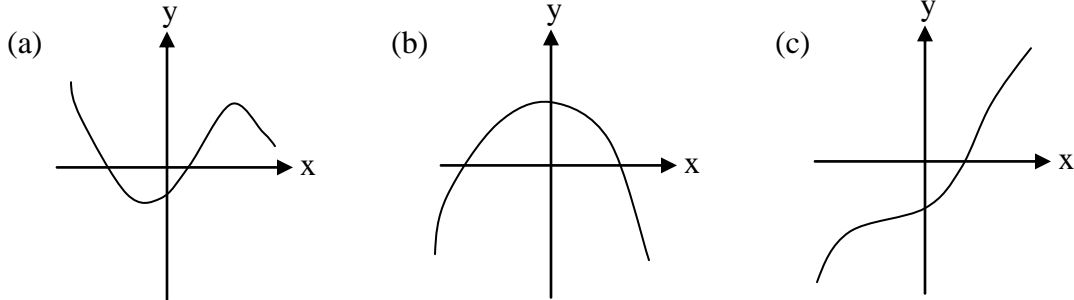
(a) $f(x) = \sqrt{8-2x}$ (b) $f(x) = \frac{1}{x-1}$ (c) $f(x) = \frac{1}{1-\sqrt{x-2}}$

- [6] 3. Given $f(x) = \frac{1}{1-x}$ and $g(x) = \sqrt{x-1}$, find the composite functions $f \circ g$ and $g \circ f$. Find also the domains of $f \circ g$ and $g \circ f$.

- [8] 4. Consider the function $f(x) = \frac{1-2x}{1+x}$.

- (a) Find the inverse function $f^{-1}(x)$.
- (b) Find the domain of $f^{-1}(x)$.
- (c) Show that the function is one to one.

- [6] 5. Each of the following graphs is the graph of a function of the type $y = f(x)$. For which of these functions does an inverse function $y = f^{-1}(x)$ exist? Give reasons for your answers.



- [9] 6. Determine whether each of the following functions is even or odd.

(a) $f(x) = x^5 - x$ (b) $f(x) = e^{-x^2}$ (c) $f(x) = x^2 + x$

- [20] 7. Evaluate each of the following limits or explain why it does not exist.

(a) $\lim_{x \rightarrow 3} \frac{x^2 - 6x + 9}{x^2 - 9}$ (b) $\lim_{x \rightarrow 0} \frac{\sqrt{4+x} - 2}{x}$ (c) $\lim_{x \rightarrow 2} \frac{x^4 - 16}{x^3 - 8}$ (d) $\lim_{x \rightarrow 0} \sqrt{x^3 - x}$

- [6] 8. If $2 - x^2 \leq g(x) \leq 2 \cos x$ for all x , find $\lim_{x \rightarrow 0} g(x)$

Total = 70