**1)** (a) Find the domain and determine the range of each function: (5marks)

$1) f(x) = \frac{x^2+8}{x-2}$

$2) f(x) = x^3 + 5x + 9$

$3) f(x) = \frac{x}{|x|}$

$4) f(x) = \sqrt{x^2 - 5x + 6}$

$5) f(x) = 2 + \sqrt{x - 2}$

(b) Let $f(x) = 2x + 1 \quad and \quad g(x) = \frac{1}{2}x + 1 \; find \; (f \circ g)(x)$

(c) classify the function as even , odd , or neither:(3marks)

1) $f(x)= x^3 - \sin x$

2) $f(x)= x^3 + 2x - 5$

3) $f(x)= x^4 - 5x^2 + 1$

Q2: (a) Compute the following Limits (4marks) **( week 4 )**

1) $\lim_{x \to 2} \frac{x^2 + 4x - 12}{x^2 - 2x}$

2) $\lim_{x \to -\infty} \frac{4x^2 - x}{2x^3 - 5}$

3) $\lim_{x \to 0} \frac{x}{\sin x}$

4) $\lim_{x \to 0} \frac{1-\cos 2x}{x}$

b) **Determine whether the following function is continuous at $x = 2$ ( week 5 ) (3marks)**

$$f(x) = \begin{cases} \frac{x^2-4}{x-2} & , x \neq 2 \\ 4 & , x = 2 \end{cases}$$

c)Find $\frac{dy}{dx}$: (3marks)

1)$y = x^3 + 2x - 5$

2)$y = (x^2 - 9)(\sqrt{x} - 5)$

3) $y = \frac{1}{2x}$