Homework Day 4 - ECON 186

Problem 1. Chiang and Wainwright 6.2 #1

#1 Given the function $y = 4x^2 + 9$:
(a)Find the difference quotient as a function of x and Δx. (Use x in lieu of x_0)
(b)Find the derivative $\frac{dy}{dx}$
(c)Find $f'(3)$ and $f'(4)$

Problem 2. Chiang and Wainwright 6.4 #1, 2, 3

#1 Given the function $q = (v^2 + v - 56)/(v - 7), (v \neq 7)$, find the left-side limit and the right-side limit of q as v approaches 7. Can we conclude from these answers that q has a limit as v approaches 7?
#2 Given $q = [(v + 2)^3 - 8]/v, (v \neq 0)$, find:
(a) $\lim_{v\to 0} q$ (b) $\lim_{v\to 2} q$ (c) $\lim_{v\to a} q$
#3 Given $q = 5 - 1/v, (v \neq 0)$,find:
(a) $\lim_{v\to +\infty} q$ (b) $\lim_{v\to -\infty} q$

Problem 3. Chiang and Wainwright 6.6 #3(a)

#3 Find the limits of $q = (3v + 5)/(v + 2)$, as $v \to 0$

Problem 4. Chiang and Wainwright 6.7 #2(a), 3(a)

#2 Taking the set of all finite real numbers as the domain of the function $q = g(v) = v^2 - 5v - 2$, Find the limit of q as v tend to N (a finite real number)
#3 Given the function $q = g(v) = \frac{v+2}{v^2+2}$:
(a)Use the limit theorems to find $\lim_{v\to N} q$, N being a finite real number.

Problem 5. Chiang and Wainwright 7.2 #3(a, b, d, f), 7(a)

#3 Differentiate the following by using the product rule:
(a)$(9x^2-2)(3x+1)$ (b)$(3x+10)(6x^2-7x)$ (d)$(ax-b)(cx^2)$ (f)$(x^2+3)x^{-1}$
#7 Find the derivatives of: $(x^2 + 3)/x$

Problem 6. Chiang and Wainwright 7.3 #1, 3(a)

#1
Given $y = u^3 + 2u$, where $u = 5 - x^2$,find dy/dx by the chain rule.
#3
Use the chain rule to find dy/dx for the following:
(a)$y = (3x^2 - 13)^3$

Problem 7. Chiang and Wainwright 10.3 #3(c,d,e)

#3
Evaluate the following by application of the rules of logarithms:
(c) ln(3/B) (d)$\ln Ae^2$ (e)$\ln ABe^{-4}$

Problem 8. Chiang and Wainwright 10.5 #1(e, f), 3(d, f), 4(c)

#1
Find the derivatives of:
(e) $y = e^{ax^2+bx+c}$ (f)$y = xe^x$
#3
Find the derivatives of:
(d)$y = 5ln(t + 1)^2$ (f)$y = ln[x(1 - x)^8]$
#4
Find the derivatives of:
(c)$y = 13^{2t+3}$