Prince Sultan University

Deanship of Educational Services

Department of Mathematics
and General Sciences

COURSE DETAILS:

BUSINESS CALCULUS	MATH 211	MAJOR EXAM I
Semester:	Spring 2018-2019 --Term 182	
Date:	Saturday February 09, 2019	
Time Allowed:	80 minutes	

STUDENT DETAILS:

Student Name:	
Student ID Number:	
Section:	
Instructor's Name:	J. Alzabut

INSTRUCTIONS:

- You may use a scientific calculator that does not have programming or graphing capabilities. NO borrowing calculators.
- NO talking or looking around during the examination.
- NO mobile phones. If your mobile is seen or heard, your exam will be taken immediately.
- Show all your work and be organized.
- You may use the back of the pages for extra space, but be sure to indicate that on the page with the problem.

GRADING:

	Page 1	Page 2	Page 3	Total
Questions	**1,2**	**3,4**	**5,6,7**	
Marks	**13**	**15**	**17**	**45**
S. Marks				

Q1) [5 points] Find the value of k that make the function $f(x)=\begin{cases}\dfrac{x^2-1}{x+1}, & x<-1\\ kx^2+x-3, & x\geq -1\end{cases}$ continuous for all x.

Q2) [8 points] Market research indicates that manufacturers will supply x printers to the marketplace when the price is $p=S(x)=3x+176$ dollars per unit and that the same number of printers will be demanded (bought) by consumers when the price is $p=D(x)=-5x+320$

a) At what level of production x **<u>and</u>** unit price p is market equilibrium achieved?

b) Sketch the graphs of the supply and demand functions on the same graph. Show the point of intersection and the y-intercepts clearly.

Q3) [5 points] Find the domain of $f(x) = \frac{1}{\sqrt{x(4-2x)}}$.

Q4) [10 points] A mobile phone manufacturer can sell phones for $45 apiece. The manufacturer's total cost consists of a fixed overhead of $3565 plus production costs of $22 per phone.

a) If x is the number of phones sold, find the total cost of production **and** the revenue derived.

b) Find the profit function and determine how many phones must be sold to break even?

c) How many phones must the manufacturer sell to make a profit of $6785?

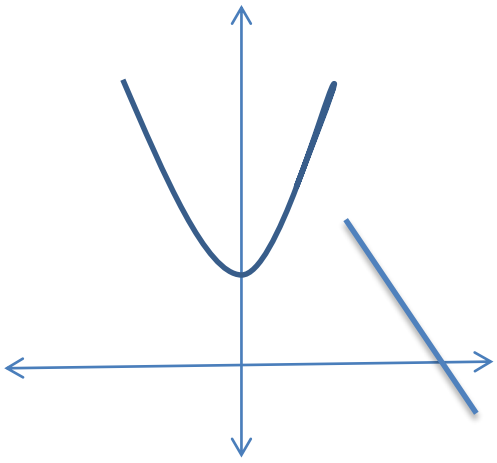
d) What will be the manufacturer's profit or loss if 150 phones are sold?

Q.5) [6 points] Evaluate the limits:

a) $\lim_{x\to\infty}\dfrac{3x^2-2x+7-5x^3}{x^3+x+1}$

b) $\lim_{x\to 3}\dfrac{9-x^2}{x-3}$

Q.6) [6 pts] Consider the graph of $f(x)$:



Evaluate the following limits:

a) $\lim_{x\to 3^+} f(x)$

b) $\lim_{x\to 3^-} f(x)$

c) $\lim_{x\to 1} f(x)$

Q.7) [5 points] Find the equation of the line which is perpendicular to the line $2x-4y+16=0$ and passing through the same $y-$intercept.