Prince Sultan University

Deanship of Educational Services

Department of Mathematics and General Sciences

COURSE DETAILS:

ORIENTATION MATHEMATICS I	MATH 001	MAJOR EXAM II A
Semester:	Fall Semester --Term 182	
Date:	Sunday March 31, 2019	
Time Allowed:	90 minutes	

STUDENT DETAILS:

Student Name:	
Student ID Number:	
Section:	
Instructor's Name:	

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.
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GRADING:

	Page 1	Page 2	Page 3	Page 4	Page 5	Total	Total
Questions							
Marks	**10**	**10**	**20**	**20**	**20**	**80**	**20**

1) The equation $2x^2+x+3=0$ has:

A) No solution
B) One real solution
C) Two real solutions
D) Two complex solutions

2) The complex conjugate of $3-5i$ is:

A) $5i-3$
B) $3i-5$
C) $-5i+3$
D) $3+5i$

3) The solution of the inequality $x^2>9$ is:

A) $(-\infty,3)$
B) $(-\infty,-3)\cup(3,\infty)$
C) $(-\infty,-3)$
D) $(-3,3)$

4) i^{1000} is equal to which of the following:

A) 1
B) $-i$
C) -1
D) i

5) If $f(x)=\dfrac{|x-3|}{x+1}$, then $f(1)$ is:

A) 1
B) -1
C) 0
D) *undefined*

You must write the correct answer to each question in the box below

Question	**1**	**2**	**3**	**4**	**5**
Answer					

6) The solution of the inequality $3x+11<5$ is:

A) $(-2,\infty)$

B) $(-\infty,-2)$

C) $[-2,2)$

D) $(2,-2]$

7) The solution of the absolute value inequality $|x-1|<2$ is:

A) $[-3,3]$

B) $(-2,2)$

C) $(-\infty,1)\cup(-2,\infty)$

D) $(-1,3)$

8) The domain of the function $h(x)=\dfrac{x}{\sqrt{x-1}}$ is:

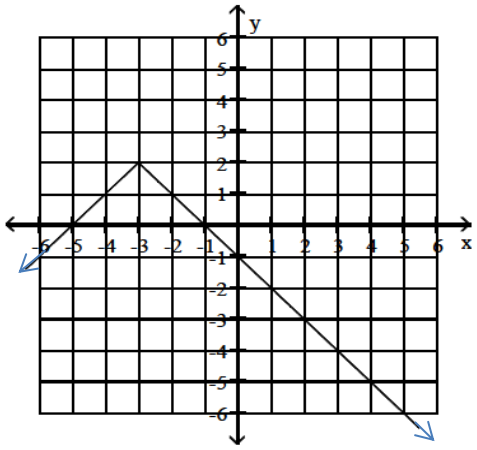
A) $(-\infty,1)\cup(1,\infty)$

B) $(-\infty,1)$

C) $(1,\infty)$

D) $(0,\infty)$

9) Which of the following is true, for the given graph:



A) $Domain:(-\infty,2)\ Range:(-\infty,2]$

B) $Domain:(-6,6)\ Range:(-\infty,-1]$

C) $Domain:(-\infty,\infty)\ Range:(-\infty,\infty)$

D) $Domain:(-\infty,\infty)\ Range:(-\infty,2]$

10) The graph of $-2f(x)$ can be obtained from the graph of $f(x)$ by:

A) Moving right 2 units and reflecting about the *x*-axis

B) Shrinking by a factor 2 and reflecting about the *y*-axis

C) Moving left 2 units and reflecting about the *y*-axis

D) Stretching by a factor 2 and reflecting about the *x*-axis

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Question	**6**	**7**	**8**	**9**	**10**
Answer					

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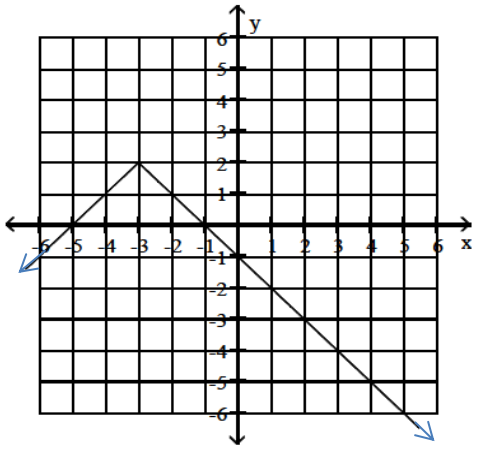

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Answer					

Q11) (4+4+4 pts) Solve the following equations:

a) $x^4 - x^2 - 10 = 2$. Find **all** solutions.

b) $x^2 - 8x + 23 = 0$ by "**completing the square**"

c) $x - \sqrt{x+1} = 5$

Q12) (4+4 pts) Solve the following inequalities:

a) $\frac{-2x}{x+1} > 0$

b) $\left|\frac{x+1}{2}\right| \geq 4$

Q13) (5 pts) Express $\frac{1-2i}{2+3i}$ in standard form $a+bi$. **Show all your steps.**

Q14) (5 pts) Solve the absolute value equation $|2x-3|-4=1$

Q15) (6 pts) Graph the piecewise function $f(x)=\begin{cases} x^2 & x \le 0 \\ x+1 & x>0 \end{cases}$. **Use a table of values.**

Q16) (4 pts) Find the domain of the function $f(x)=\frac{x+1}{2x^2+x-1}$

Q17) (4 pts) Find the **average rate of change** of $f(x)=\dfrac{30}{x+7}$, between $x=-2$ and $x=3$.

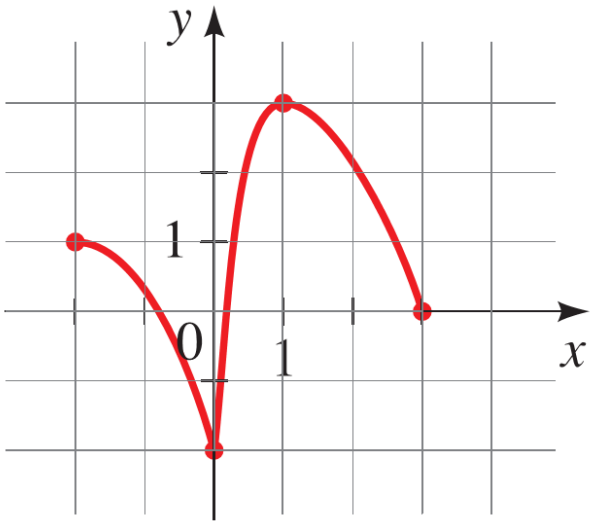
Q18) (6 pts) The graph of a function $g(x)$ is given. Find the following:

a) The value of $g(3)$

b) The value of x for which $g(x)=3$

c) The coordinates of the local maximum of $g(x)$.

d) The interval(s) on which $g(x)$ is decreasing?



Q19) (6 pts) Use transformations of the graph of $f(x)=\sqrt{x}$, to sketch the graph of $g(x)=-\sqrt{x-1}+3$. **Show all your steps.**

Q20) (4 pts) Let $f(x)=3x^2-1$ and $g(x)=\dfrac{1}{\sqrt{x+3}}$. Find $f\circ g(0)$ and $g\circ f(0)$.