Prince Sultan University

Deanship of Educational Services

PYP Department / Mathematics

COURSE DETAILS:

ORIENTATION MATHEMATICS I	MATH 001	FINAL EXAM A
Semester:	Fall Semester --Term 191	
Date:	Saturday December 14, 2019	
Time Allowed:	120 minutes (2 hours)	

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.
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GRADING:

	Page 1	Page 2	Page 3	Page 4	Page 5	Total	Total
Questions							
Marks	10	10	24	19	17	80	40

Q.1A (20 points) **Choose the correct answer**

1) Find the **distance** between the two points: $(4,-6)$ and $(5,2)$

A) distance $=\sqrt{17}$

B) distance $=\sqrt{97}$

C) distance $=\sqrt{65}$

D) distance $=\sqrt{63}$

2) Let $f(x)=\dfrac{2}{x-6}$ and $g(x)=\dfrac{x}{x+1}$, then the **domain** of $(f+g)(x)$ is:

A) $[-1,6]$

B) $\mathbb{R}-\{-1,6\}$

C) $(-1,6)$

D) $\mathbb{R}-\{-1,0,6\}$

3) Find the ***x*-intercepts** of the graph of the equation: $y=(x+4)^2-1$

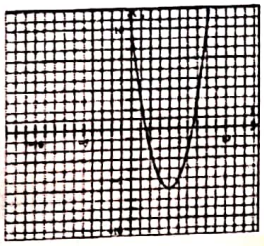
A) $\{3,5\}$

B) $\{-5,-3\}$

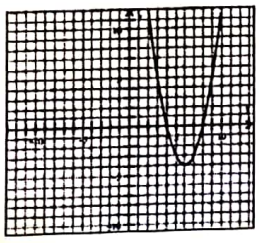
C) $\{-3\}$

D) $\{-4,1\}$

4) Use the graph of $f(x)=x^2$ and the transformations to obtain the graph of $g(x)=(x-4)^2-6$:



A)



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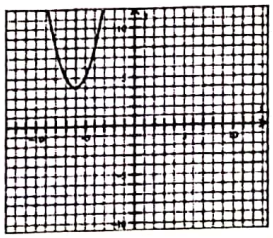

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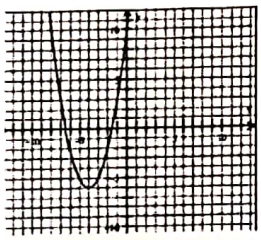


D)

5) Factor completely. y^5-16y

A) $y(y-2)(y+2)(y^2+4)$

B) $y(y-4)^2(y+4)^2$

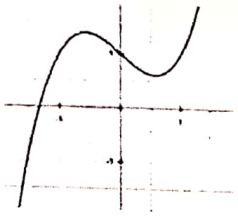
C) $y^2(y^2-8y+16)$

D) $y(y^4-8y^2+16)$

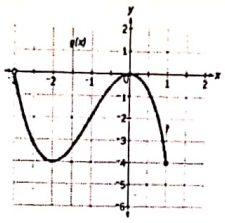
You must write the correct answer to each question in the box below

Question	1	2	3	4	5
Answer					

6A) Which of the following is a graph of a **one-to-one function?**



A)



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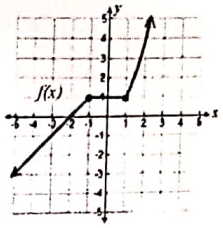
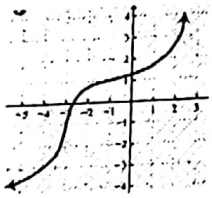


C)



D)

7) Find the equation of the circle with center $(-2,3)$ and radius 5

A) $(x+2)^2+(y-3)^2=5$

B) $(x-2)^2+(y+3)^2=25$

C) $(x+2)^2+(y-3)^2=25$

D) $(x-2)^2-(y+3)^2=25$

8) $\left(\frac{x^{-6}y^4}{x^2y^{-1}}\right)^{-2}=$

A) $\frac{x^8}{y^6}$

B) $\frac{y^{10}}{x^{16}}$

C) $\frac{x^{16}}{y^{10}}$

D) $\frac{y^6}{x^8}$

9) Find the solution set of the inequality: $|x-2|+4=10$

A) $\{-6,6\}$

B) $\{4\}$

C) $\{-8,4\}$

D) $\{-4,8\}$

10) Find the solution set of the inequality: $x(x-3)<0$

A) $(3,\infty)$

B) $(-\infty,0)\cup(3,\infty)$

C) $(0,3)$

D) $(-\infty,3)$

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

Question	6	7	8	9	10
Answer					

Q.2A (3+3+4 points): Perform the indicated operations and **simplify.**

a) $(4x-3)^2$

b) $\sqrt{3x^3}\cdot\sqrt{8x^2}$

c) $\dfrac{x^2-5x-6}{x}\div\dfrac{x^2-36}{x+6}$

Q.3 (6 points): Find an equation in of the line that passes through $(1,-2)$ and is **perpendicular** to the line passing through $(3,4)$ and $(0,6)$

Q.4 (8 points): Solve the following equations. Give the solution set. **(Don't use a calculator)**

a) $2(1-x)=3(1+2x)+15$

b) $4x^2-3x=7$

Q.5A (4 points): Find the **inverse function,** $f^{-1}(x)$ for $f(x)=3+\sqrt{x+2}$; x is positive

Q.6 (6points): Use the graph f to find each of the following.

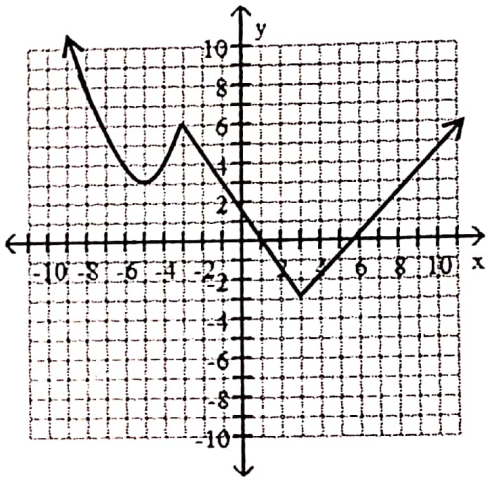
a) The **range** of f

b) Intervals where the graph is **increasing**

c) **Coordinates of the local maximum**

d) The **values of x** for which $f(x)=0$

e) $f'(6)=$



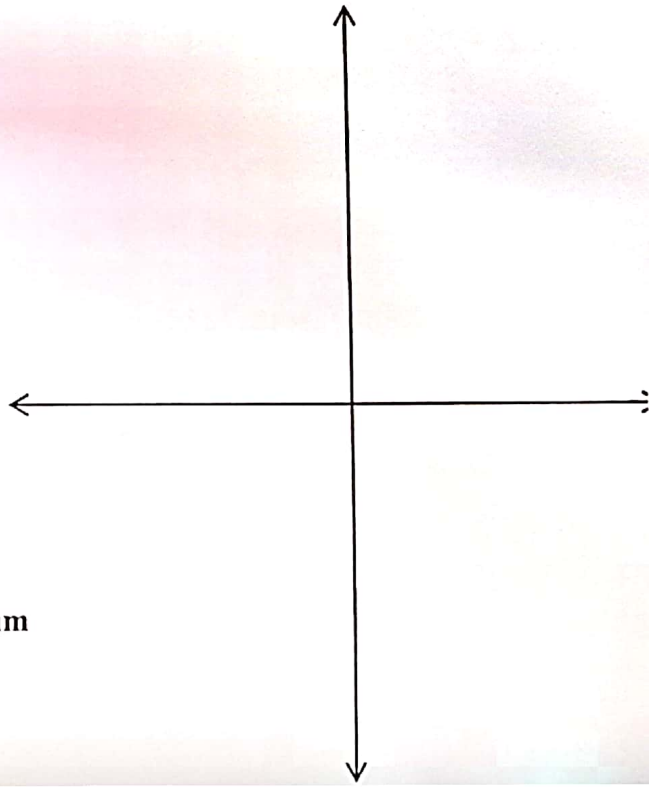
Q.7 (9 points): Consider the quadratic function $f(x)=-x^2+4x+5$

a) Find the **vertex** of f

b) Find the $x-$intercepts, if any

c) Find the $y-$intercept

d) Determine whether f has **a maximum or a minimum**



Q.8A (5 points): Find all **the zeros of** P **(real and complex).** $P(x) = x^4 + 3x^2 - 4$

(Don't use a calculator)

Q.9 (6 points): Use the **Synthetic division to show that** $x = 3$ is a zero of $P(x) = x^3 - x^2 - 11x + 15$, then **find all other zeros of** P. **(Show all your steps and don't use a calculator)**

Q.10 (6 points): Find a **fourth – degree** polynomial that has -1, 1, 3 and 5 **as zeros.**
(Simplify as much as possible)

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Q.1B (20 points) **Choose the correct answer**

1) Factor completely. $y^5 - 16y$

A) $y\left(y^4 - 8y^2 + 16\right)$

B) $y^2\left(y^2 - 8y + 16\right)$

C) $y(y-4)^2(y+4)^2$

D) $y(y-2)(y+2)\left(y^2+4\right)$

2) Find the solution set of the inequality: $|x-2|+4=10$

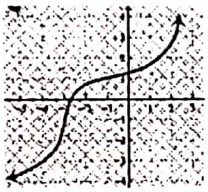
A) $\{-4,8\}$

B) $\{-8,4\}$

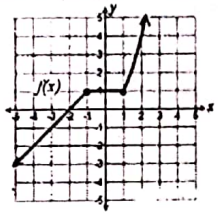
C) $\{4\}$

D) $\{-6,6\}$

3) Which of the following is a graph of a **one-to-one function?**



A)



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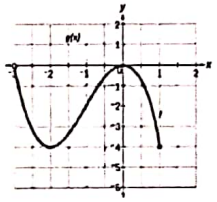
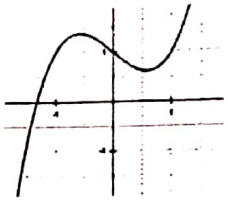


C)



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B) $\mathbb{R}-\{-1,0,6\}$

C) $\mathbb{R}-\{-1,6\}$

D) $[-1,6]$

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

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Answer					

6B) $\left(\frac{x^{-6}y^{4}}{x^{2}y^{-1}}\right)^{-2} =$

A) $\frac{y^{6}}{x^{8}}$

B) $\frac{x^{16}}{y^{10}}$

C) $\frac{y^{10}}{x^{16}}$

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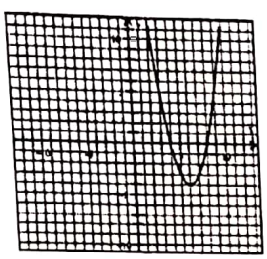

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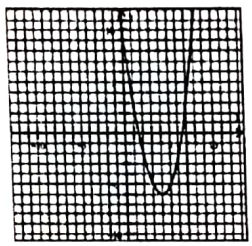

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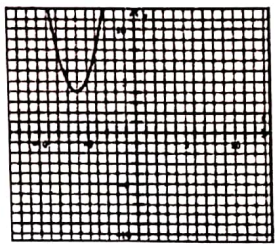

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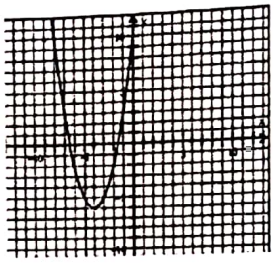

D)

8) Find the ***x*-intercepts** of the graph of the equation: $y=(x+4)^{2}-1$

A) $\{-3\}$

B) $\{-4,1\}$

C) $\{3,5\}$

D) $\{-5,-3\}$

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A) $(x-2)^{2}-(y+3)^{2}=25$

B) $(x+2)^{2}+(y-3)^{2}=25$

C) $(x-2)^{2}+(y+3)^{2}=25$

D) $(x+2)^{2}+(y-3)^{2}=5$

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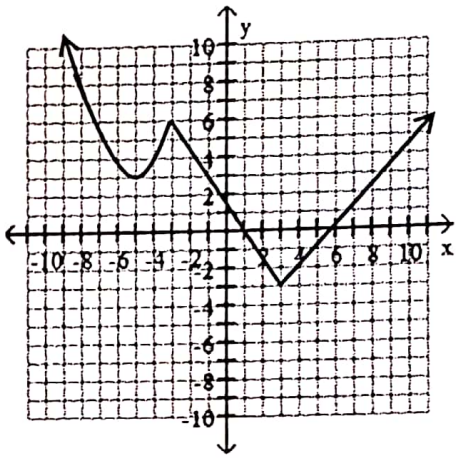

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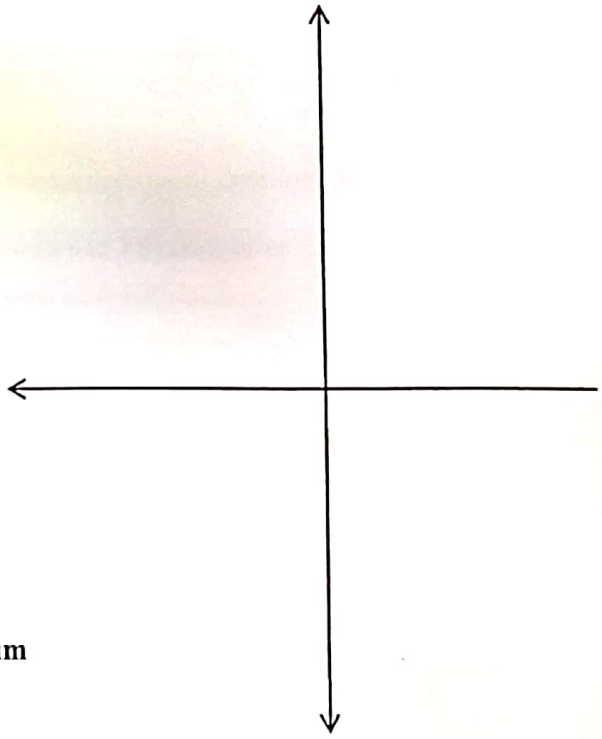

c) Find the $y-$intercept

d) Determine whether f has **a maximum or a minimum**

e) **Sketch the graph** f