Prince Sultan University

Deanship of Educational Services

PYP Department / Mathematics

COURSE DETAILS:

ORIENTATION MATHEMATICS I	MATH 001	MAJOR EXAM I A
Semester:	Fall Semester --Term 191	
Date:	Monday October 21, 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.
- 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	Page 4	Total	Total
Questions						
Marks	**10**	**10**	**23**	**37**	**80**	**20**

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

1) The value of the expression $\frac{3x+6y}{y-3}$ for $x=2$ and $y=-3$ is:

A) -2
B) 4
C) 2
D) -12

2) Find the **midpoint** of line segment between the points $(3,-6)$ and $(-11,12)$

A) $(4,-3)$
B) $(7,-9)$
C) $(-4,-9)$
D) $(-4,3)$

3) The **product** of $(x-2)(x+6)$ is:

A) $x^2-4x-12$
B) $x^2-8x-12$
C) $x^2+4x-12$
D) $x^2+8x-12$

4) Which expression is **equivalent** to $(3x+6)^2$?

A) $3x^2+36x+36$
B) $9x^2+36x+36$
C) $9x^2+36x+12$
D) $9x^2+18x+36$

5) **Factor** the following expression **completely** $3x^3+x^2+12x+4$

A) $(3x+1)(x^2+4)$
B) $(3x+1)(x+2)(x-2)$
C) $(x^3+2)(x^2+3)$
D) $(x^2+2)(x+3)$

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

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

A6) Find the **distance** between the points $P(0,-3)$ and $Q(4,0)$

A) 25

B) 5

C) 1

D) 7

7) Find the **domain** of the expression $\sqrt{x-1}$

A) $[1,\infty)$

B) $(1,\infty)$

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

D) $\mathbb{R}-(1,\infty)$

8) Find the **equation of the circle** with center $(2,-5)$ and radius 2.

A) $(x-2)^2+(y+5)^2=16$

B) $(x-2)^2+(y+5)^2=2$

C) $(x+2)^2+(y-5)^2=4$

D) $(x-2)^2+(y+5)^2=4$

9) Find the **equation of the line** passing through the point $(-1,4)$ and has slope = 0.

A) $(y-4)=(x+1)$

B) $x=-1$

C) $x+y=3$

D) $y=4$

10) Find the **slope** of the line passing through $(-5,2)$ and $(4,-6)$

A) $-\frac{9}{8}$

B) 4

C) $-\frac{8}{9}$

D) $-\frac{2}{11}$

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

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

Q.2A (3+2+2 points): Factor the expression **completely**:

a) $x^4 + 5x^3 - 6x^2$

b) $64x^2 - 9y^2$

c) $4x^2 + 11x - 3$

Q.3 (4+4+4 points): Simplify the following expressions:

a) $\left[\frac{20x^2y^6}{5x^6y^{-3}}\right]^{-3}$

b) $10x - \left[8 - 4(x - 3)\right]$

c) $\frac{\sqrt{432x^4}}{\sqrt{3x}}$; assume x is positive

Q.4 (4 points): Rationalize the denominator: $\frac{-3}{\sqrt{5}-2}$. **Show your steps and don't use a calculator**

Q.5A (6 points): Find an **equation of the line** passing through $(8,-4)$ that is **perpendicular** to the line $4x-5y=12$

Q.6 (7+4 points): Perform the indicated operation and **simplify**:

a) $\dfrac{x^2+7x+12}{x^2+2x-3} \div \dfrac{x^2+4x}{x^2-1}$

b) $(2x+4)^3$

Q.7 (7+6 points): Solve the following equations:

a) $\dfrac{5}{x-2}+\dfrac{1}{x^2-2x}=\dfrac{3}{x}$

b) $2(x-1)+3=x-3(x+1)$

Q.8 (7 points): Use a table of points to **sketch** the graph of $y=4-2|x|$

Show the ***x*-intercept and the *y*-intercepts.**