Prince Sultan University

Deanship of Educational Services
Department of Mathematics
and General Sciences

COURSE DETAILS:

ORIENTATION MATHEMATICS I	MATH 001	MAJOR EXAM I A
Semester:	Spring Semester --Term 182	
Date:	Sunday February 24, 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	Page 5	Total	Total
Questions							
Marks	**10**	**10**	**22**	**18**	**20**	**80**	**20**

1) Use properties of real numbers to write the following expression without parentheses:

$-\frac{7}{4}(20x-12y)$

A) $35x-21y$

B) $35y-21x$

C) $21y-35x$

D) $21x-35y$

2) Express the inequality $-1 \le x < 0$ in interval notation.

A) $x \in [-1,0)$

B) $x \in [-1,0]$

C) $x \in (-\infty,-1) \cap (0,\infty)$

D) $x \in (-1,0]$

3) Find $A \cap B$ if $A = \{3,8,9,11,14\}$ and $B = \{-4,8,10,11\}$.

A) $A \cap B = \{-4,10\}$

B) $A \cap B = \{8,11\}$

C) $A \cap B = \{-4,3,8,9\}$

D) $A \cap B = \phi$

4) Which expression is equivalent to $(5x^3-7)^2$:

A) $25x^5-35x^3+14$

B) $25x^5-70x^3+49$

C) $25x^6-70x^3+49$

D) $25x^6-35x^3+49$

5) Factor the expression completely: $x^4+5x^3-6x^2$

A) $x^2(x+6)(x-1)$

B) $x^2(x-6)(x-1)$

C) $x^2(x+3)(x-2)$

D) $x^2(x+2)(x-3)$

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

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

6) Use a Factoring Formula to factor the expression: $64s^3 - 125t^3$

A) $(4s-5t)(16s^2-20st+25t^2)$

B) $(4s-5t)(16s^2+20st+25t^2)$

C) $(4s-5t)(16s^2+40st+25t^2)$

D) $(4s-5t)(16s^2-40st+25t^2)$

7) Perform the indicated operations and simplify $\frac{1}{x+5}+\frac{2}{x-3}$:

A) $\frac{3x-7}{(x+5)(x-3)}$

B) $\frac{3x+7}{(x+5)(x-3)}$

C) $\frac{2x+7}{(x+5)(x-3)}$

D) $\frac{x+7}{(x+5)(x-3)}$

8) The distance between the points $(-2,3)$ and $(4,-5)$ is:

A) 10

B) $2\sqrt{2}$

C) 100

D) $\frac{-4}{3}$

9) The **midpoint** of line segment between the points $(-2,3)$ and $(4,-5)$ is:

A) $(6,8)$

B) $(3,-4)$

C) $(2,-2)$

D) $(1,-1)$

10) The slope of the line passing through $(2,3)$ and $(4,-5)$ is

A) $\frac{1}{4}$

B) $\frac{-1}{3}$

C) -4

D) $2\sqrt{17}$

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

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

11) [3+1+2 pts] Use the following set $\left\{0,\ -5,\ 40,\ \frac{23}{6},\ \sqrt{7},\ 1.\overline{35},\ -\frac{2}{5},\ \pi\right\}$ to write the set of:

a) Integers

b) Natural Numbers

c) Irrational Numbers

12) [4+4+4+4 pts] Simplify the following expressions:

a) $\left(\frac{a^3 \cdot b^{-5}}{ac^{-2}}\right)^3$

b) $\left(3x^5y^4\right)^5\left(2x^4y^5\right)^{-3}$

c) $\sqrt[3]{\frac{54x^2y^4}{2x^8y}}$

d) $\sqrt{16x}+\sqrt{x^5}$

13) [4 pts] Rationalize the denominator of: $\dfrac{2}{3-\sqrt{5}}$

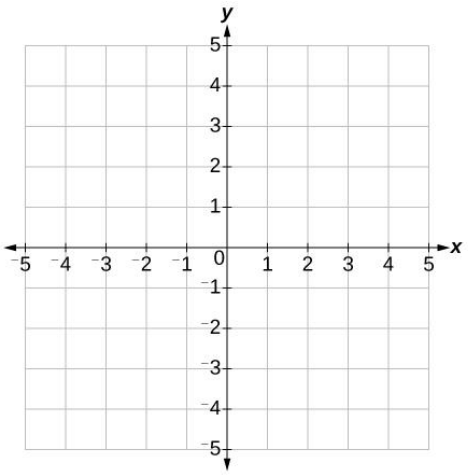
14) [4 pts] Solve the equation: $\dfrac{9}{x-10}+\dfrac{2}{x+10}=\dfrac{81}{x^2-100}$

15) [4 pts] Simplify the expression: $\dfrac{1+\dfrac{1}{x-5}}{1-\dfrac{1}{x-5}}$

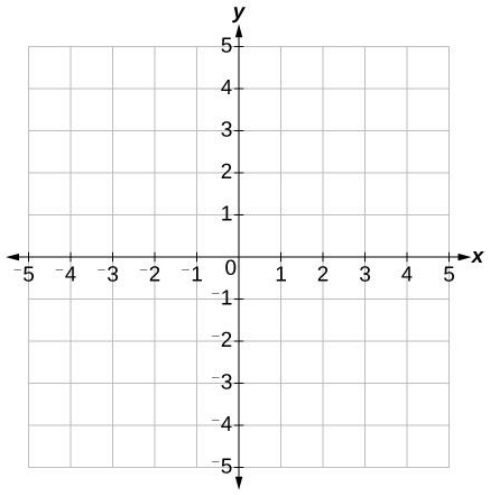
16) [6 pts] Perform the indicated operation and simplify $\dfrac{x^2+2x-15}{x^2-25}\cdot\dfrac{x-5}{x+2}$

17) [4 pts] Factor the expression completely $(3x+2)^2+8(3x+2)+12$

18) [4 pts] Sketch the graph of $3x-4y-12=0$. Show the *x*-intercept and the *y*-intercept.



19) [6 pts] Find the **center** and **radius** of the circle $x^2+(y+1)^2=9$, then sketch the graph.



20) [6 pts] Find the equation of the line passing through $(-5,2)$ that is perpendicular to the line $3x-2y=5$