Prince Sultan University
Deanship of Educational Services
Department of Mathematics
and General Sciences

COURSE DETAILS:

ORIENTATION MATHEMATICS I	**MATH 001**	**FINAL EXAM A**
Semester:	Fall Semester --Term 181	
Date:	Saturday December 15, 2018	
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.
- 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**	**21**	**21**	**18**	**80**	**40**

Q1) Evaluate the expression $(9x)^{2/3}+(2y)^{2/3}+(z)^{2/3}$ for $x=3, y=4, z=-1$

A) 16
B) 12
C) 14
D) 10

Q2) Simplify the expression: $\dfrac{1+\dfrac{1}{x-5}}{1-\dfrac{1}{x-5}}$

A) $\dfrac{x-4}{x-6}$
B) $\dfrac{x-6}{x-4}$
C) $\dfrac{4-x}{6+x}$
D) $\dfrac{x-5}{x-6}$

Q3) The midpoint of the line segment joining the points $(2,-1)$ and $(6,3)$ is

A) $(-4,4)$
B) $(4,2)$
C) $(2,2)$
D) $(4,1)$

Q4) Let $x=2-3i$ and $y=1+i$. Then the expression $\dfrac{y+x}{y-1}$ simplified to standard form $a+bi$ is:

A) $4-i$
B) $-2-3i$
C) $4+i$
D) $6-5i$

Q5) Perform the indicated operations and simplify $\dfrac{1}{x+5}+\dfrac{2}{x-3}$:

A) $\dfrac{2x+7}{(x+5)(x-3)}$
B) $\dfrac{3x-7}{(x+5)(x-3)}$
C) $\dfrac{3x+7}{(x+5)(x-3)}$
D) $\dfrac{x+7}{(x+5)(x-3)}$

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

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

Q6) $\left(\sqrt{h^2+4}+2\right)\left(\sqrt{h^2+4}-2\right)$ is equal to which of the following:

A) h^2+2

B) $|h|$

C) h

D) h^2

Q7) The discriminant $D=b^2-4ac$ of the equation $x^2=4x-4$ is

A) $D=0$

B) $D=32$

C) $D=8$

D) $D=64$

Q8) What is the solution to the inequality $(x-3)(x+1)>0$?

A) $(-\infty,-3)\cup(-1,\infty)$

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

C) $(-\infty,-1)\cup(1,3)\cup(3,\infty)$

D) $(-\infty,-1)\cup(3,\infty)$

Q9) Which of the following functions is even?

A) $f(x)=x^2+x^5$

B) $f(x)=x^4+3$

C) $f(x)=x^4-x^3$

D) $f(x)=x^3$

Q10) $\left(\sqrt{c}+\frac{1}{\sqrt{c}}\right)^2$ is:

A) $\left(\frac{c+1}{c}\right)^2$

B) $\frac{\left(\sqrt{c}+1\right)^2}{\sqrt{c}}$

C) $\frac{(c+1)^2}{c}$

D) $\left(\frac{\sqrt{c}+1}{\sqrt{c}}\right)^2$

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

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

Q11) (6pts) Multiply and simplify the following:

a) $(2-5x)^3$

b) $(3x-5)(3x+5)$

Q12) (4pts) Solve the equation $(x-1)(x+2)=(x-2)(x-3)$

Q13) (4pts) Write the value or values of the variable that must be excluded from the solution set. Then solve the equation: $\frac{1}{x+3}+\frac{5}{x^2-9}=\frac{2}{x-3}$

Q14) (4pts) Find all real solutions of the equation $(3x-4)^2=7$

Q15) (3pts) Find the distance between the points: $(3\sqrt{2},3)$ and $(5\sqrt{2},-3)$.

Q16) (4pts) Find the center and the radius of the circle $x^2 + y^2 - 4x + 10y + 13 = 0$.

Q17) (4pts) Find the equation of the line that has x-intercept -2 and is parallel to the line $2x + 3y - 5 = 0$.

Q18) (4pts) Find all real solutions of the equation $\sqrt{10 - 3x} + 2 = x$

Q19) (5pts) Find all solutions of the equation $x^5 - 7x^3 - 18x = 0$

Q20) (4pts) Solve the equation $x^3 - 4x^2 + x + 6 = 0$ given that -1 is a zero of this equation (use synthetic division)

Q21) (5 pts) Let $f(x)=\sqrt{x-4}$ and $g(x)=x^2$ find the following:

a) $(f+g)(5)$

b) $(f\circ g)(2)$

c) The domain of $(f+g)(x)$

Q22) (7pts) Consider the function $f(x)=2(x-1)^2-8$

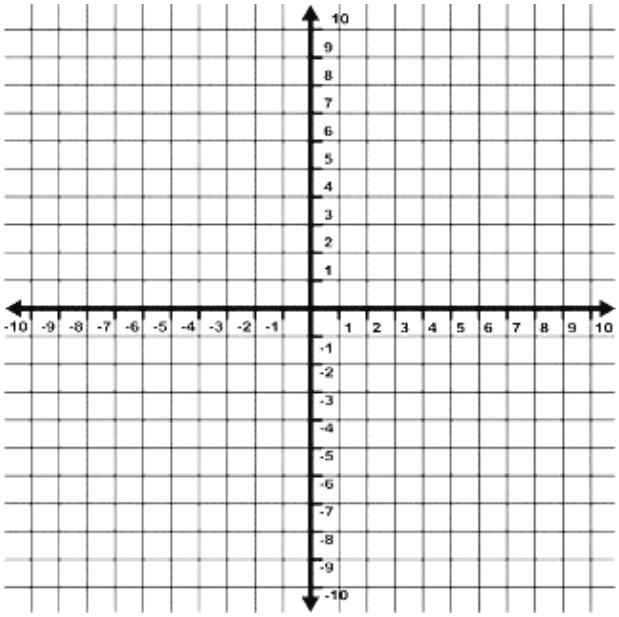
a) Find the vertex of $f(x)$.

b) Find the $x-$intercepts of $f(x)$

c) Find the $y-$intercept of $f(x)$.

d) Determine whether $f(x)$ has a minimum or a maximum.

e) Graph $f(x)$.



Q23) (6pts) Consider the function $f(x)=-3x^2(x-3)^4(x+2)^3$.

a) Use the Leading Coefficient Test to determine the end behavior of the graph.

b) Find the zeros and their Multiplicities and determine whether the graph crosses or touches the *x*-axis at each zero.. **Do not graph the function.**