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

COURSE DETAILS:

ORIENTATION MATHEMATICS I	MATH 001	MAJOR EXAM 2 A
Semester:	Spring Semester --Term 172	
Date:	Monday April 9, 2018	
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	24	18	18	80	20

1) The equation $2x^2 + 10x + 5 = 0$ has

A) One repeated real solution
B) Two different real solutions
C) Two conjugate complex solutions
D) No solution exists

2) The expression $10i + \left(-1 + \sqrt{-25}\right)^2$ in standard form is

A) -24
B) $16i + 1$
C) $24i$
D) $16i - 1$

3) Consider the function graphed below. Which of the following is true about the function?
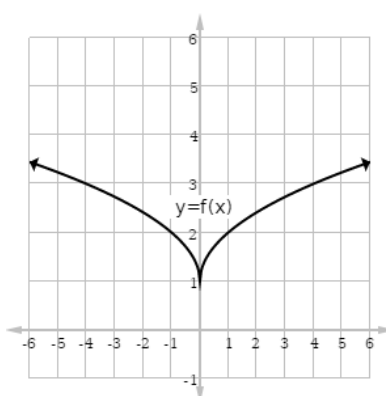
A) The function increases on $(0, \infty)$

B) The function decreases on $(0, \infty)$

C) The function increases on $(1, \infty)$

D) The function decreases on $(1, \infty)$

4) Determine whether the function $f(x) = 2x^3 - 4x$ is even, odd, neither or both (even **and** odd).
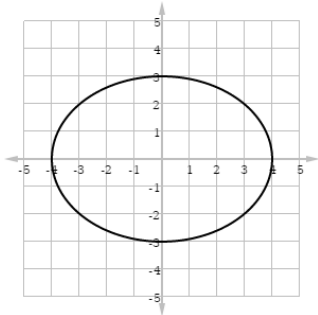
A) Even
B) Odd
C) Neither
D) Both

5) Given $f(x) = x^2 + 3x$ and $g(x) = \dfrac{x+1}{x^2+1}$, what is the value of $f(2) - g(-2)$?

A) $\dfrac{26}{25}$

B) $\dfrac{7}{25}$

C) $\dfrac{51}{5}$

D) $\dfrac{51}{25}$

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

Question	1	2	3	4	5
Answer					

1

6) Identify the y and x intercepts of the following graph:

A) $(3,0), (-3,0), (0-4), (0,4)$

B) $(0,3), (0,-3), (-4,0), (4,0)$

C) $(3,0), (0,4)$

D) $(-3,0), (0,-4)$

7) The line $y = 2x + 11$ passes through the point with coordinates $(a, 7)$. The value of a must be:

A) 25
B) −2
C) 9.5
D) 9

8) The slope of a line **perpendicular** to the line with equation $y = 3 - \dfrac{x}{4}$ is

A) 4
B) $\dfrac{-1}{4}$
C) 3
D) $\dfrac{-1}{3}$

9) Solve $-2|3x + 1| - 8 \geq -18$

A) $[-\frac{4}{3}, 2]$
B) $\left[-2, \frac{4}{3}\right]$
C) $(-\infty, -2) \cup \left[\frac{4}{3}, \infty\right)$
D) None of the above

10) Solve $x^{\frac{3}{2}} - 7 = 1$

A) $\{4\}$
B) $\{-4, 4\}$
C) $\{2\}$
D) $\{-2, 2\}$

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

Question	6	7	8	9	10
Answer					

2

11) [4 pts] Simplify $\dfrac{3}{4+2i}$ and write the answer in standard form.

12) [5+5 pts] Solve each of the following equations using the method stated **(show all your steps):**

a) $x^2 + 2x - 15 = 0$ (using the Quadratic Formula).

b) $x^2 - 4x + 6 = 0$ (by Completing the Square).

13) [5+5 pts] Let $f(x) = x^2 + 2x$. Answer the following:

(i) Evaluate the difference quotient $\dfrac{f(x+h) - f(x)}{h}$

(ii) Find the average rate of change for $f(x) = x^2 + 2x$ from $x_1 = 1$ to $x_2 = 3$

14) [6+6+6 pts] Solve the following equations **(show all your steps):**

a) $x^4 - x^2 - 6 = 0$

b) $\sqrt{x+6} = x - 6$

c) $x^3 - 2x^2 = 6 - 3x$

15) [4 pts] Find the slope of the line whose x-intercept is 5 and y-intercept is -3.

16) [6 pts] Find the equation of the line (in Slope-Intercept form) that passes through $(-3,2)$ and is **parallel** to the line $2x - y + 7 = 0$

17) [8 pts] Given the graph of the function f below, answer the questions that follow:

(i) Find the domain of f?

(ii) Find the range of f?

(iii) What is the value of $f(1) + f(3)$?

(iv) What is x when $f(x) = -1$?

(v) What is the y intercept?

(vi) Where is the graph of the function f decreasing?

(vii) Where is the graph of the function f increasing?

y=f(x)