



Prince Sultan University
Orientation Mathematics Program
MATH 001 Major Exam 1
Term 162
Monday, March 20, 2017
Time Allowed: 90 minutes

Name: _____ Student ID #: _____

Instructors Name _____ Section No.: _____

Important Instructions:

1. You may use a scientific calculator but NOT your mobile phone,
2. You may NOT borrow a calculator from anyone.
3. You may NOT use notes or any textbook.
4. There should be NO talking during the test.
5. Your exam will be taken immediately if your mobile phone is seen or heard.
6. Looking around or making an attempt to cheat will result in your exam being cancelled.
7. This examination has 13 problems.

Problems	Max points	Student's Points
1-3	15	
4-7	23	
8	19	
9-13	23	
Total	80	
Total	20	

GIVE YOUR ANSWER IN THE SIMPLEST FORM. SHOW ALL YOUR WORK IN DETAIL.

1) [9 pts] Simplify the following:

a) $3 - 2[m(m + 6) - 3(2 - m)]$

b) $(12x^{-1}y^3)(2x^5y^{-2})$

c) $\left(\frac{27x^6y^{-4}\sqrt{z}}{3x^3y^{-2}z^{\frac{1}{4}}} \right)^2$

2) [3 pts] Rationalize the denominator $\frac{6}{\sqrt{7} + \sqrt{4}}$

3) [3 pts] Add $\sqrt[3]{64ab^3} - b\sqrt[3]{125a}$

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4) [9 pts] Find and simplify the following:

a) $(5p^2q - 3p)(5p^2q + 3p)$

b) $(4s - 5t)^2$

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

5) [4 pts] Simplify $\frac{\frac{12}{x-7} - \frac{x}{x+7}}{\frac{3}{x^2-49}}$

6) [5 pts] Divide $\frac{6x-30}{3x^3+6x^2} \div \frac{x^2-4x-5}{x^2-4}$

7) [5 pts] Subtract $\frac{3}{x^2-5x-14} - \frac{2x}{x^2-6x-7}$ and **state the domain.**

GIVE YOUR ANSWER IN THE SIMPLEST FORM. SHOW ALL YOUR WORK IN DETAIL.

8) [4+3+4+4+4 pts] Factorize the following expressions completely:

a) $75x^3 + 50x^2 - 27x - 18$

b) $8x^2 - 2xy - y^2$

c) $27x^3 + 8y^3$

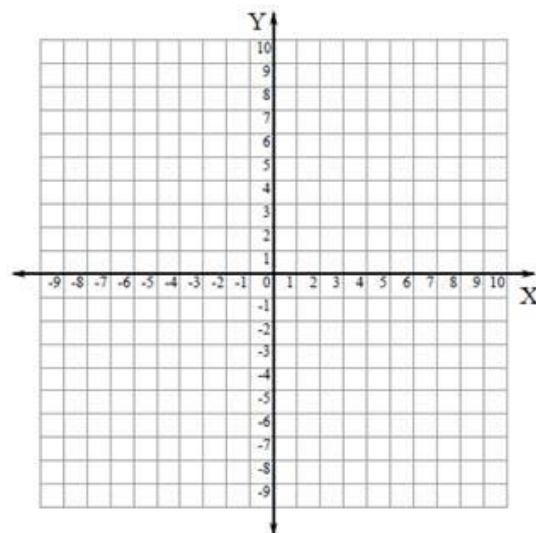
d) $x^2 - 121a^2 + 36 - 12x$

e) $2(x+1)^{-\frac{1}{3}} - (x+1)^{\frac{2}{3}}$

GIVE YOUR ANSWER IN THE SIMPLEST FORM. SHOW ALL YOUR WORK IN DETAIL.

- 9) [6 pts] Use the table of values below to graph
 $y = x^2 - 2x - 3$

x	-2	-1	0	1	2	3	4
y							



- 10) [4 pts] Solve $3(x+2) - 2(x-1) + x = -(x+3) - 4x$

- 11) [5 pts] Solve $\frac{2}{x-5} + \frac{5}{x-1} = \frac{3x-7}{x^2-6x+5}$

- 12) [4 pts] Simplify $\frac{4-8i}{3+6i}$

- 13) [4 pts] Simplify $(2+\sqrt{-16})(3-\sqrt{-9})$