Write your name clearly and indicate your recitation section with an X. No calculator is permitted. Use only the scrap paper given in the exam. Do not tear any pages from the exam.

Name: _____

X	Instructor	Time
	Harrison Hsu	11:00am-12:15am
	Harrison Hsu	12:30pm-1:45pm
	Gyuhak Kim	11:00am-12:15am
	Gyuhak Kim	12:30pm-1:45pm

I pledge that I have observed the NYU honor code, and that I neither given nor received unauthorized assistance during this exam.

Signature: _____

Do not write in the chart below

Problem	Score
MC	
1	
2	
Total	

This is the multiple choice section of the exam. Each equation is worth 3 points. There is no partial credit for any multiple choice problem. **Enter your final selections in the table given.**

Problem	
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	

Note that all variables in radical (or fractional exponent) notation throughout this multiple choice section are assumed to be positive unless told otherwise. **Do not forget to transfer all multiple choice answers to the table on page 2.**

1. Let $A = \{x : x \geq 4\}$, $B = \{x : x < 5\}$, $C = \{x : -1 < x \leq 6\}$. Find $B \cup C$.

   (a) $\{x : x < 6\}$.

   (b) $\{x : x \leq 6\}$.

   (c) $\{x : 5 < x < 6\}$.

   (d) $\{x : 5 \leq x \leq 6\}$.

   (e) None of these.

2. Simplify the expression $\sqrt[3]{125x} + \sqrt[3]{80x^4}$.

   (a) $(5x + 2)\sqrt[3]{x}$.

   (b) $8x\sqrt[3]{x}$.

   (c) $(5 + 2x)\sqrt[3]{5x}$.

   (d) $5\sqrt[3]{x} + 2x\sqrt[3]{10x}$.

   (e) None of these.

3. Simplify the expression $\sqrt[4]{x \cdot \sqrt[7]{x^2}}$.

   (a) $x^{1/12}$.

   (b) $x^{5/28}$.

   (c) $x^{9/28}$.

   (d) $x^{7/18}$.

   (e) None of these.

4. Simplify the expression $\left(\dfrac{s^6 t^{-4}}{8s^{-1}t}\right)^{-2}$.

   (a) $\dfrac{64t^{10}}{s^{14}}$.

   (b) $\dfrac{s^{14}}{64t^{10}}$.

   (c) $\dfrac{t^{10}s^{14}}{64}$.

   (d) $\dfrac{64}{t^{10}s^{14}}$.

   (e) None of these.

Scrap paper for problems 1-4.

5. Perform the indicated operation and simplify $(\sqrt{h^7+1}+1)(\sqrt{h^7+1}-1)$.

(a) h^7+1.

(b) h^7-1.

(c) h^7+2.

(d) $h^7+2\sqrt{h}-1$.

(e) None of these.

6. Factor the expression completely $x^{-1/2}(x+7)^{1/2}+x^{1/2}(x+7)^{-1/2}$.

(a) $\frac{2x-7}{\sqrt{x}\sqrt{x+7}}$.

(b) $\frac{x+2}{\sqrt{x+7}}$.

(c) $\frac{x-2}{\sqrt{x+7}}$.

(d) $\frac{x+7}{\sqrt{x}\sqrt{x-7}}$.

(e) None of these.

7. In order to make the expression x^2-9x into a perfect square we add what

(a) 9/2.

(b) 81/4.

(c) $-\frac{9}{4}$.

(d) $-\frac{81}{2}$.

(e) None of these.

Scrap paper for problems 5-8.

8. Perform the multiplication or division and simplify

$$\frac{\left(\frac{x^3}{x+4}\right)}{\left(\frac{x}{x^2+8x+16}\right)}$$

(a) $\frac{2x+1}{x+5}$.

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

(c) $\frac{2x+4}{x-5}$.

(d) $x^4(x-4)$

(e) None of these.

9. Rationalize the denominator $\frac{2(x-y)}{\sqrt{x}-\sqrt{y}}$.

(a) $\frac{2x\sqrt{x}}{x-y}$

(b) $\frac{2x+2y}{xy}$.

(c) $\frac{2\sqrt{x}+2\sqrt{y}}{x+y}$.

(d) $2(\sqrt{x}+\sqrt{y})$.

(e) None of these.

10. Solve for x in the equation $\frac{ax+b}{cx+d} = 5$.

(a) $\frac{5b-d}{5a-c}$.

(b) $\frac{c-d}{a-b}$.

(c) $\frac{5d-b}{a-5c}$.

(d) $\frac{c-5d}{a-b}$.

(e) None of these.

11. Craig is saving to buy a vacation home. He inherits some money from a wealthy uncle, then combines it with the \$29,000 he has already saved and doubles the total in a lucky investment. He ends up with \$ 128,000 - just enough to buy a cabin on the lake. How much did he inherit?

(a) \$ 40,000.

(b) \$ 35,000.

(c) \$ 22,000.

(d) \$ 47,000.

(e) None of these.

Scrap paper for problems 9-11.

This is the open response section of the midterm. Partial credit may be given. Answers without justification will receive no credit.

1.(9 points) Solve the non-linear inequality. Express the final answer in interval notation.

$$(x-7)(x+1)^2 < 0.$$

Show all work for problem 1 in the space below. If you need more space, use the back of this page.

2.(8 points) Find all real solutions of the equation

$$\sqrt{8-x}+2=x-4.$$

Check your answer(s). If there is no real solution write NO REAL SOLUTION. Show all work for problem 2 in the space below. If you need more space, use the back of this page.

Stop Here. Show your NYU ID when submitting your exam.