MATH190 – Spring 24 Exam 1 Study Guide

Exam Format: The exam will be in-person. You will have 75 minutes to complete the exam. The exam will have six multiple choice questions and six short answer questions, for a total of twelve questions. The multiple-choice questions are worth two points each, and the short-answer questions are worth four points each.

Exam Material: The exam will cover sections P.2 to P.7**.** Exam 1 ***will not cover*** section P.8, Solving Basic Equations. A detailed list of learning objectives, definitions, and practice problems is included in the table below.

Past Exam Archive: Scan the QR code to access the MATH190 Course Page. There you will find the link to the Past Exam Archive. Use the exam archive to study past exam problems that match to the learning objectives below.

SCAN ME

Exam Rules:

Please bring: A pencil, your CCNY ID card, your EMPLID

Prohibited Items: Notes, Textbooks, Calculators, Phones, Smart Watches, and all Electronic Devices. You cannot communicate with anyone else during the exam except your instructor if you have a question.

If a student uses one of the prohibited items during the exam, it will be considered a violation of the academic honesty policy and reported to the Office of Academic Standards. All electronic devices should be turned off and put away out of sight.

Topic	**Sec**	**Learning Objectives: (You should be able to)**	**Definitions**	**Quiz/Past Exam One Problems**
Real Numbers	P.2	• Work with Properties of Real Numbers • Add, Subtract, Multiply and Divide Real Numbers • Use Interval Notation • Find the absolute value of a real number	Distributive Property, Least Common Denominator, Absolute Value	All problems from Quiz 1 F23 E1 A/B #1, 3 S23 E1 A/B #4 F22 E1 A/B/C/D # 6
Integer Exponents	P.3	• Use exponential notation • Use the Laws of Exponents	Repeated multiplication, exponent, base	All problems from Quiz 2 F23 E1 A/B #2, 7 S23 E1 A/B #9, 10 F22 E1 A/B/C/D # 9
Radicals and Rational Exponents	P.4	• Work with nth roots • Simplify Radicals • Simplify Expressions with Rational Exponents • Rationalize the denominator	Radical, Rational Exponent	All problems from Quiz 3 F23 E1A/B #5, 10 S23 E1 A/B #13, 14 F22 E1 A/B/C/D # 17,18,19
Algebraic Expressions	P.5	• Add and Subtract Polynomials • Multiply Polynomials • Know formulas for Special Products	Monomial, Binomial, Trinomial, Polynomial, Algebraic Expression	All problems from Quiz 4 F23 E1 A/B #4, 12 S23 E1 A/B #2 F22 E1 A/B/C/D # 14, 16
Factoring	P.6	• Factor expressions by finding a Common Factor • Factor Trinomials • Use Special Factoring Formulas	Factors, To Factor, Term, AC- Method, Perfect Squares	All problems from Quis 5 F23 E1 A/B #8, 11

		• Factor an expression Completely • Factor by Grouping		F22 E1 A/B/C/D # 1, 7
Rational Expressions	P.7	• Determine the Domain of an Expression • Reduce a Rational Expression to Lowest Terms • Multiply and Divide Rational Expressions • Add and Subtract Rational Expressions • Simplify Complex Rational Expressions • Rationalize the Denominator and Numerator • Know Common Algebra Errors	Rational Expression, Compound/Complex Fraction,	All problems from Quiz 6 F23 E1 A/B #6, 9 S23 E1 A/B #5, 6, 11 F22 E1 A/B/C/D #2, 3, 10, 11, 13, 20

Answer all 12 questions. For the multiple questions no partial credit will be allowed. For short answer questions partial credit will be given. Utilize the information provided for each question to determine your answer. Record your answers on your on the line.

---

1. Use the properties of real numbers to write the expression without parentheses.

$$-\frac{11}{5}(5x - 25y)$$

A. $11y - 55x$

B. $55x - 11y$

C. $11x + 55y$

D. $11x - 55y$

E. $55y - 11x$

1. _____

2. Simplify the expression below, eliminate any negative exponents.

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

2. _____

3. Simplify the expression $\sqrt[3]{a^2b}\sqrt[3]{a^4b}$.

A. $a^2\sqrt[3]{b}$

B. $a^2\sqrt[3]{b^2}$

C. $a^2\sqrt{3}b^2$

D. $a^2\sqrt{b^2}$

E. $b^3\sqrt[3]{a^2}$

3. _____

4. Perform the indicated operation and simplify: $(\sqrt{h^2+1}+1)(\sqrt{h^2+1}-1)$

4. _____

5. Find two factorizations of the expression: $8x^2 + 56x$

5. _____

6. Simplify the rational expression: $\frac{x^2-25}{x^2-x-20}$

   A. $\frac{5}{4}$
   B. $\frac{x-5}{x-4}$
   C. $\frac{x+5}{x+4}$
   D. $\frac{25}{x+20}$
   E. None of the above

6. _____

7. Simplify completely: $\frac{3}{2} - \frac{3}{8} + \frac{1}{4}$

7. _____

8. Simplify the expression $(6x^{-3}y^3)(5x^2)^2$ completely.

8. _____

9. Rationalize the denominator: $\frac{4}{\sqrt{5}}$.

9. _____

10. Perform the indicated operation and simplify: $(x+2)(x^2+2x+3)$

10. _____

11. Factor the expression $x^2 - 14x + 48$ completely.

11. _____

12. Perform the indicated operation and simplify: $\frac{x^2-36}{x^2-16} \div \frac{x+6}{3x+12}$

12. _____