

## MATH190 – Spring 24 Exam 2 Study Guide

**Exam Format:** The exam will be in-person. You will have 75 minutes to complete it. It 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.8 to 1.7. Exam 1 ***will not cover*** section 1.8, Solving Inequalities. The table below includes a detailed list of learning objectives, definitions, and practice problems.

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.



### 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)	Quiz/Past Exam One Problems
Solving Basic Equations	P.8	<ul style="list-style-type: none"> <li>Solve a linear equation</li> <li>Solve a power equation</li> <li>Solve an equation for one variable in terms of others</li> </ul>	All problems from Quiz 7 S23 E1 A/B #3, 20 F22 E1 A/B/C/D # 8, 12 F23 E2 A # 2, 11 F23 E2 C # 1, 5, 9
The Coordinate Plane	1.1	<ul style="list-style-type: none"> <li>Use the distance formula</li> <li>Use the midpoint formula</li> </ul>	All problems from Quiz 8 S23 E1 A/B #16, 19 F22 E1 A/B/C/D # 9 F22 E2 A/B/C/D #4 F23 E2 A # 7 F23 E2 C # 6,
Graphs of Equations in Two Variables	1.2	<ul style="list-style-type: none"> <li>Graph equations by plotting points</li> <li>Find intercepts from a graph</li> <li>Find intercepts from an equation</li> </ul>	All problems from Quiz 8 S23 E1 A/B #8 F22 E1 A/B/C/D # 17,18,19
Circles	1.3	<ul style="list-style-type: none"> <li>Write the standard form of the equation of a circle</li> <li>Graph a circle</li> <li>Understand how to complete the square</li> </ul>	All problems from Quiz 9 S23 E1 A/B #18

		<ul style="list-style-type: none"> <li>• Work with the general form of the equation of a circle</li> </ul>	F22 E1 A/B/C/D #4 F23 E2 A # 1 F23 E2 C 2, 10, 15
Lines	1.4	<ul style="list-style-type: none"> <li>• Calculate the slope of a line</li> <li>• Graph lines given a point and the slope</li> <li>• Use the point-slope form of a line</li> <li>• Use the slope-intercept form of the equation of a line</li> <li>• Find the equation of vertical and horizontal lines</li> <li>• Find an equation of a line given two points</li> <li>• Graph lines written in general form using intercepts</li> <li>• Find equations of parallel lines</li> <li>• Find equations of perpendicular lines</li> </ul>	All problems from Quiz 10  F22 E1 A/B/C/D # 1, 7  F22 E2 A/B/C/D #5  F23 E2 A # 3, 5  F23 E2 C # 3, 8
Solving Quadratic Equations	1.5	<ul style="list-style-type: none"> <li>• Solve a quadratic equation by factoring</li> <li>• Solve a quadratic equation by completing the square</li> <li>• Solve a quadratic equation using the quadratic formula</li> </ul>	All problems from Quiz 11  S23 E1 A/B #12  F22 E1 A/B/C/D #5, 15  F23 E2 A # 8  F23 E2 C # 4, 11, 16
Solving Other Types of Equations	1.7	<ul style="list-style-type: none"> <li>• Solve polynomial equations</li> <li>• Solve radical equations</li> <li>• Solve equations involving fraction expression</li> </ul>	All problems from Quiz 12  F23 E2 A # 9, 11  F23 E2 C# 1, 7, 14

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.

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1. The equation of a circle is  $x^2 + y^2 + 6y = 7$ . What are the coordinates of the center and the length of the radius of the circle?
- A. center  $(0, 3)$  and radius 4
  - B. center  $(0, -3)$  and radius 4
  - C. center  $(0, 3)$  and radius 16
  - D. center  $(0, -3)$  and radius 16
  - E. none of the above

1. \_\_\_\_\_

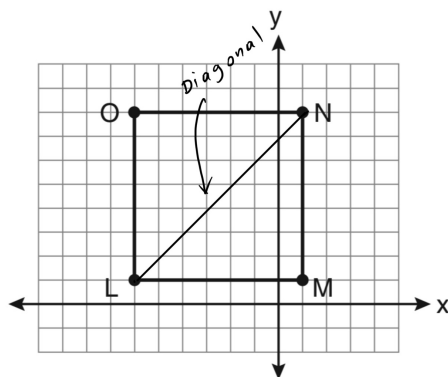
2. Which equation represents a line that is perpendicular to the line represented by  $2x - y = 7$ ?
- A.  $y = -\frac{1}{2}x + 6$
  - B.  $y = \frac{1}{2}x + 6$
  - C.  $y = -2x + 6$
  - D.  $y = 2x + 6$
  - E. none of the above

2. \_\_\_\_\_

3. What is the value of  $x$  in the equation  $\frac{2}{x} - 3 = \frac{26}{x}$ ?
- A.  $-8$
  - B.  $-\frac{1}{8}$
  - C.  $\frac{1}{8}$
  - D.  $8$
  - E. none of the above

3. \_\_\_\_\_

4. Square  $LMNO$  is shown in the diagram below.



What are the coordinates of the midpoint of diagonal  $\overline{LN}$ ?

- A.  $(\frac{9}{2}, -\frac{5}{2})$
- B.  $(-\frac{7}{2}, \frac{7}{2})$
- C.  $(-\frac{5}{2}, \frac{7}{2})$
- D.  $(-\frac{5}{2}, \frac{9}{2})$
- E. none of the above

4. \_\_\_\_\_

5. If the formula for the perimeter of a rectangle is  $P = 2l + 2w$  then  $w$  can be expressed as

- A.  $w = \frac{2l-P}{2}$
- B.  $w = \frac{P-2l}{2}$
- C.  $w = \frac{P-l}{2}$
- D. none of the above
- E.  $w = \frac{P-2w}{2l}$

5. \_\_\_\_\_

6. Which of the following quadratic equations has only one real solution?

- A.  $4x^2 = 3x - 8$
- B.  $10x = 2 - x^2$
- C.  $7x^2 + 2x - 5 = 0$
- D.  $3x^2 - 6x + 3 = 0$
- E. none of the above

6. \_\_\_\_\_

7. Solve the radical equation  $\sqrt{4x+2} + 2 = 6$  for  $x$ .

7. \_\_\_\_\_

8. Find the equation of the line that passes through the point  $(1, -6)$  and is parallel to the line  $x + 2y = 6$ . Write your answer in  $y = mx + b$  form.

8. \_\_\_\_\_

9. **Use the Quadratic Formula** to solve the quadratic equation  $3x^2 + 6x - 5 = 0$ .

9. \_\_\_\_\_

10. Find the distance between the points  $(0, 8)$  and  $(6, 16)$ .

10. \_\_\_\_\_

11. Find the  $x$ - and  $y$ -intercepts of the graph of the equation  $y - 2xy + 2x = 1$ . Write your answers in coordinate point form  $(x, y)$ .

11. \_\_\_\_\_

12. Solve the equation  $\frac{x}{3} - 1 = \frac{5}{3}x + 7$  for  $x$ .

12. \_\_\_\_\_