Algebra and Calculus: Quiz 2

Name/NetID: _____

Complete all problems.

1. For **multiple choice** problems, circle the letter corresponding to the correct answer.

2. For **true or false** problems, indicate whether you believe the statement is $\boxed{\text{true}}$ or $\boxed{\text{false}}$ and put a box around your answer (as shown).

3. For **free response** problems, **show all work** and put a $\boxed{\text{box}}$ around your final answer.

Good luck!

1. For the following three problems, answer **true or false**:

   (a) $\frac{a}{x} + bx = 0$ is a linear equation.

   (b) If the discriminant of the quadratic equation $ax^2 + bx + c = 0$ is greater than zero, then there are two distinct real solutions.

   (c) There are two distinct real solutions to the equation $(x + 2)^2 - 2x - 3 = 0$.

2. Kim is interested in renting a tiny rectangular studio apartment in SoHo with an area of 72 ft^2. She measures the dimensions and determines that the length exceeds the width by 6 feet. What is the length of the studio?

   (a) 9 ft.

   (b) 15 ft.

   (c) 12 ft.

   (d) 27 ft.

   (e) 28 ft.

3. John has taken three exams in his history class so far. His exam grades are: 76, 89, and 93. John has one more exam left to take. Assuming his final grade is based entirely on the average of his exam grades, what grade must he earn on his last exam to receive an exact final grade of 88 in the class?

   (a) 88

   (b) 85

   (c) 72

   (d) 94

   (e) 100

4. Which of the following describes the solution set to the equation: $x^4 - 3x^2 + 2 = 0$?

   (a) $x = -1, x = 1, x = \sqrt{2}$

   (b) $x = -1, x = 1, x = \sqrt{2}, x = -\sqrt{2}$

   (c) All $x > 0$

   (d) $x = 1, x = -3, x = 2, x = \sqrt{2}$

   (e) $x = 1, x = 3, x = -2, x = \sqrt{2}$

5. Irena and Qiu are studying together for an Algebra and Calculus exam. They decide to divide up a set of 6 problems. It would take Irena 9 minutes to complete all the problems on her own, while it would take Qiu 18 minutes to complete all the problems on his own. When they collaborated, it took them just 6 minutes to complete all 6 problems.

   Assuming that nobody took any breaks and they were working simultaneously, how many problems did Irena complete?

   Hint: They're working **simultaneously**, which means that their combined *rate* of problem-solving should be greater than the rate at which they would complete problems if they took turns (i.e. if Irena worked on a problem while Qiu waited for her to finish, which would be inefficient).