MAC 1105, Spring 2018.

Exam #1, ver B

February 5, 2018

Name _____

- You will be told when to begin the work and when to terminate work on the examination. You must stop when instructed. Points may be deducted in case of violations.

- Please show your work to support your answers that require calculations. Correct but unsupported answers may not be given full credit.

- The use of a cell phone or other electronic communication devices during the examination is not allowed. The exam will be canceled and a grade of "0" will be assigned to anyone who uses a cell phone during the examination or if one is found within hands reach.

- Calculators are not allowed on this exam.

- The exam consists of two parts. Part I contains 5 multiple choice questions worth five points each. Part II contains four open ended questions worth 15 points each if not stated otherwise.

Part I

Choose your answer from five available choices. No partial credit will be given for wrong answers.

1. Simplify $(x - 2)(x + 2) + x(x - 1)$

   (a) $2x^2 - 5x + 4$
   (b) $2x^2 - x - 4$
   (c) $x^2 - 5x + 4$
   (d) $x^2 - 4x + 4 + x^2 - x$
   (e) None of the above

2. Simplify and express the result in the standard form, $a + bi$.

$$(2i - 1)^2$$

   (a) $-3 - 4i$
   (b) $5 - 4i$
   (c) $5 + 4i$
   (d) $4i^2 - 4i + 1$
   (e) None of the above

3. Determine the number and type of solutions for the following equation

$$x^2 + 7x = 3$$

   (a) One complex solution.
   (b) One real solutions.
   (c) Two real solution.
   (d) Two complex solutions.
   (e) None of the above.

4. Find the standard form equation of the circle given by

$$x^2 + y^2 - 6x + 2y + 6 = 0$$

(a) $(x - 3)^2 + (y + 1)^2 = 2^2$

(b) $(x + 3)^2 + (y - 1)^2 = 4^2$

(c) $(x + 3)^2 + (y + 1)^2 = 4^2$

(d) $(x + 3)^2 + (y - 1)^2 = 2^2$

(e) None of the above

5. Select two lines that are **perpendicular**.

(a) $y = 2x - 1$

(b) $y = -2x - 1$

(c) $y = 2(x - 1)$

(d) $y = -\frac{1}{2}x - 1$

Part II

6. Find the line connecting the points $(-1, 3)$ and $(1, 4)$ and write the equation in

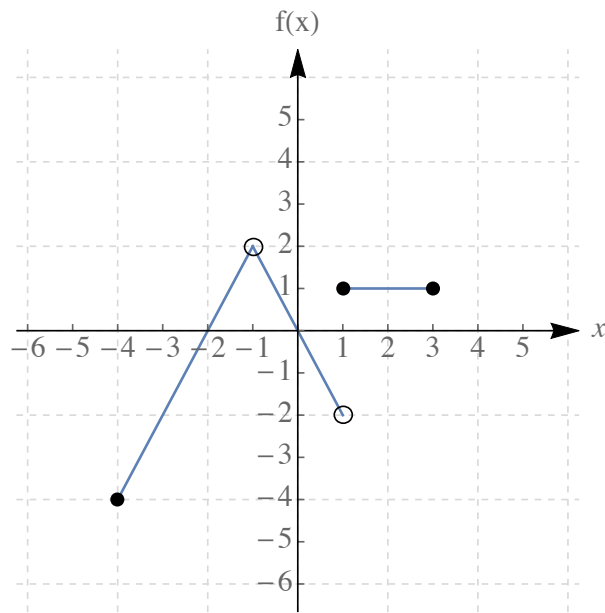(a) slope–intercept form

(b) general form

7. Find the distance between the points $(1, 1)$ and $(5, 4)$. Simplify your answer.

8. (15 points each) Solve for x and include any complex solutions.

   (a) $\sqrt{5x - 4} + 2 = x$

   (b) $x^3 + x^2 = -2x - 2$ [Hint: Solve by factoring]

9. Consider the following function.

(a) Find the domain and range of the graph of the function.

(b) Find $f(-2)$ and $f(1)$.