

**Practice Exam 4/ Sections 10.6, 10.7, 10.8, 11.1, 11.2, 11.3, 11.6**

No notes are permitted as the exam is taken. However, calculators are allowed. Work must be shown in order to qualify for possible partial credit. A lack of work shown may result in loss of points.

1. Solve the radical equations. Checking the solution(s) would be wise.

(a)  $\sqrt{2x-5} = 13$

$$\sqrt[3]{3z+7} - 2 = -3$$

(c)  $x = \sqrt{x-1} + 3$

2. One leg of a right triangle has a length of 2 yards and the hypotenuse of the same triangle has a length of 3 yards. Find the length of the other leg.

3. Find the straight-line distance between the points (2, -9) and (-3, 3).

4. Perform the indicated operation and simplify. Write each answer in the form  $a + bi$ .

(a)  $(7 + 4i)(-3 - 2i)$

(b)  $\frac{10}{5 - 9i}$

5. Solve the quadratic equation. It would be wise to check your solutions.

(a)  $(x - 5)^2 = 10$

(b)  $t^2 + 6t - 5 = 0$

(c)  $3x^2 - 7x + 2 = 0$

(d)  $11(x - 2) + (x - 5) = (x + 2)(x - 6)$

6. Write a quadratic equation having the given numbers as solutions.

(a) 7 and -6

(b)  $5i$  and  $-5i$

7. For the following quadratic equations, answer the questions. Then, state reasons for your answers.

(a)  $3x^2 - 6x + 3 = 0$       How many solutions are there? \_\_\_\_\_  
Are the solutions real or imaginary? \_\_\_\_\_  
If they are real, are they rational or irrational? \_\_\_\_\_

(b)  $2x^2 - 9x + 10 = 0$       How many solutions are there? \_\_\_\_\_  
Are the solutions real or imaginary? \_\_\_\_\_  
If they are real, are they rational or irrational? \_\_\_\_\_

8. For each of the following, graph the function and find the vertex, the axis of symmetry, and the maximum value or the minimum value of the function. Include at least four other points besides the vertex as you graph these.

(a)  $f(x) = (x - 1)^2 - 3$       vertex: \_\_\_\_\_  
axis of symmetry: \_\_\_\_\_  
max/min value: \_\_\_\_\_

(b)  $g(x) = -2(x + 2)^2 + 4$

vertex: \_\_\_\_\_

axis of symmetry: \_\_\_\_\_

max/min value: \_\_\_\_\_