Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Sections 11.3, 11.5, 11.6 & 11.8 Review

1. Identify the zeros (roots) of the following polynomial equations.

|  |  |
| --- | --- |
| a. (x + 4)(2x + 1) = 0 | b. x(2x – 3)(x – 4) = 0 |
| c.  | d. 4x(x + 3)(x – 3) = 0 |

2. Factor the following polynomials.

|  |  |
| --- | --- |
| a.  | b.  |
| c.  | d.  |
| e.  | f.  |
| g.  | h.  |

3. Factor the following and find the zeros (roots) of these polynomial equations.

|  |  |
| --- | --- |
| a.  | b.  |
| c.  | d.  |
| e.  |

4. Write two different polynomial functions with zeros at 4, , and -1.

5. Write two different polynomial functions with zeros at -6, 3, and 0.

6. Give an example of a polynomial function in factored form that has:

 a. a double root at x = 4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 b. 2 as a root with multiplicity 3 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

 c. -7 as a root with multiplicity 4 \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

7. Find all four roots and state the multiplicity of each.

 

 x = \_\_\_\_\_\_\_\_\_ with multiplicity \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 x = \_\_\_\_\_\_\_\_\_ with multiplicity \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 x = \_\_\_\_\_\_\_\_\_ with multiplicity \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 x = \_\_\_\_\_\_\_\_\_ with multiplicity \_\_\_\_\_\_\_\_\_\_\_\_\_\_

8. Consider the equation 

 a. This equation has exactly \_\_\_\_\_\_\_\_\_\_\_\_\_ roots if multiplicities of multiple roots are counted.

 b. \_\_\_\_\_\_\_\_\_\_\_\_\_ is a(n) root with multiplicity \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 rational/irrational/complex

 c. \_\_\_\_\_\_\_\_\_\_\_\_\_ is a(n) root with multiplicity \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 rational/irrational/complex

 d. \_\_\_\_\_\_\_\_\_\_\_\_\_ is a(n) root with multiplicity \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 rational/irrational/complex

 e. \_\_\_\_\_\_\_\_\_\_\_\_\_ is a(n) root with multiplicity \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 rational/irrational/complex

 f. \_\_\_\_\_\_\_\_\_\_\_\_\_ is a(n) root with multiplicity \_\_\_\_\_\_\_\_\_\_\_\_\_\_

 rational/irrational/complex

9. Solve using the quadratic formula: 

 How many real solutions are there? \_\_\_\_\_\_\_\_\_\_\_

 How many non-real complex solutions? \_\_\_\_\_\_\_\_\_\_\_\_

 If there are any real solutions, how many are rational? \_\_\_\_\_\_\_\_\_\_\_

ANSWERS to Sections 11.5, 11.6, 11.8 Review

1a. {-4, -1/2} b. {0, 3/2, 4} c. {-3/2, 5} d. {0, -3, 3}

2a (2x + 3y)(2x – 3y) b.  c. (x + 11)(x – 2)

d.  e.  f. 

g.  h. (2x + 1)(3x + 2)

3a.  b. 

 c.  d.  e. 

4. 

5. 

6. a.  b.  c. 

7.  with multiplicity = 2; *x* = 5 with multiplicity = 3;

 *x* = *i* with multiplicity = 1 *x* = - *i* with multiplicity = 1

8. a. 7 b. -2 is a rational root with multiplicity = 3

 c.  is an irrational with multiplicity 1 d.  is an irrational with multiplicity 1

 e. 2i is an complex with multiplicity 1 f. - 2i is an complex with multiplicity 1

9. .

 There are 2 real solutions, no complex solutions and no rational roots.