

**Objectives Assessed by MA 153 Test 3**  
**Chapter 5 (not 5.4), 8.1, and Sections 9.1-9.3**  
**Thursday, Dec. 3, 2009**

1. Understand vertical and horizontal shifts of a function as an outside/inside *additive* change to the function rule.  
Section **5.1** #2-25, 27-39, 41-45 and **Chapter 5 Review** #1-4, 17, 19, 26
2. Understand vertical or horizontal reflections of a function as an outside/inside change to the function rule *by a negative sign*.  
Be able to combine these with shift transformations.  
Section **5.2** #4-6, 8-19, 24, 25, 28, 29 and **Chapter 5 Review** #1-4, 27, 28
3. Identify whether a function is odd, even, or neither by looking at its graph, equation or table.  
Section **5.2** #1-3, 20-23, 32, 34, 35, 42 and **Chapter 5 Review** 5-10 and **Chapter 9 Review** 37abcdefg and 39
4. If given that a function is odd or even and a point on its graph, determine another point.  
**Section 5.2** #30 and 31
5. Understand vertical stretch or compression of a function as an outside *multiplicative* change to the function rule.  
Be able to combine these with reflections and shift transformations.  
**Section 5.3** #1-24, 28-38 and **Chapter 5 Review** #1-4, 18, 20, 23, 29, 37, 38
6. Understand the standard form, vertex form, and factored form of a parabola. Convert from standard form to vertex form by completing the square or using a grapher and a shift transformation. **Section 5.5** #15, 16, 25-27
7. Find the vertex, axis of symmetry, concavity, whether the graph is narrower, wider, or same shape as  $y = x^2$ , and intercepts if given its equation. Be able to sketch without a graphing calculator.  
**Section 5.5** #1-6, 19-29, 34-35 and **Chapter 5 Review** #41
8. Find a quadratic model if given its zeros or its vertex and at least one other point.  
**Section 5.5** #7-14, 29 and **Chapter 5 Review** #13-16
9. Determine the composition  $f(g(x))$ . Simplify if necessary.  
**Section 8.1** #5, 7-10, 18-21 and **Chapter 8 Review** #1-11, 15h, 46
10. Know the six basic shapes of power functions (pages 378-379) and their equations. Know when they are flipped.  
Section **9.1** #7-10, 25-31 and **Chapter 9 Review** 7-8
11. Find the formula for a power function  $f(x) = kx^p$  if given that it passes through two points  $(a, f(a))$  and  $(b, f(b))$ , where  $a = 1$ .  
**Section 9.1** #11-13, 19 and **Chapter 9 Review** 9
12. Find the formula for a power function  $f(x) = kx^p$  if given that it passes through two points  $(a, f(a))$  and  $(b, f(b))$ , where  $a \neq 1$ .  
**Section 9.1** #20-22 and **Chapter 9 Review** 10
13. Identify the degree, leading term, leading coefficient, and long-run behavior of a polynomial if given in expanded or factored form. **Section 9.2** #1-10, 16, 18 and **Chapter 9 Review** 11-14
14. Determine the zeros of a polynomial if given its equation in expanded or factored form. If necessary, use a graphing calculator or try to factor.  
**Section 9.2** #12 and Section **9.3** #1-4, 8, 11-13, 37-42, 47 and **Chapter 9 Review** 15-16
15. Use a graphing calculator to find maximum or minimum values of a function as well as intersections.  
**Section 9.2** #13, 20, 23
16. Use the graph and the expanded form of a polynomial function to find its factored form.  
Section **9.3** #5-7
17. Understand the (short-run) behavior of a polynomial function near its zeros. See **Example 3** and the box on page 405.  
Section **9.3** #9, 10, 14, 49
18. Find the formula for a polynomial from its graph.  
Section **9.3** #15-20, 22-34, 48 and **Chapter 9 Review** 31-34, 36, 46, 47

Start your review by doing the following:

**Check Your Understanding Chapter 5** (page 237): 1-21, 24-29

**Check Your Understanding Chapter 8** (page 385): 2-7, 11-15

**Check Your Understanding Chapter 9** (page 439): 1-28