

Chapter 2 Study Guide

Name: _____ Date: _____

***** THIS IS NOT HOMEWORK*****

2.1	2.2	2.3	2.4	2.5
Quadratics	Parts of Polynomial	Long Division	Complex Numbers	Fundamental Theorem of Algebra
Standard Form	End Behavior	Synthetic Division	• Equality	Finding the polynomial given the zeros
Vertex	Leading Coefficient	Rational Zeros Test	• Adding	Finding zeros given any polynomial
X-Intercepts	Zeros/Multiplicity	Descartes' Rule of Signs	• Subtracting	
Writing Equations	Sketching Graphs	Calculator—Zeros	• Multiplying	
			• Dividing	

Lesson 2.1— Describe the graph of the function and identify the vertex. Identify any x-intercepts.

1. $f(x) = (x - 4)^2 - 4$

2. $f(x) = 3x^2 - 12x + 11$

Lesson 2.1— Write the standard form of the function that has the indicated vertex and passes through the point.

3. Vertex: (2,3) Point: (0,2)

4. Vertex: (1, -4) Point: (2, -3)

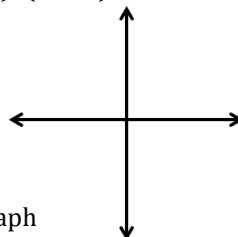
Lesson 2.2— State the constant, degree, leading coefficient, and number of terms. Describe the end behavior.

5. $f(x) = -4x^3 - 8x + 21$

6. $f(x) = x(x - 5)^4(x + 3)^3(x - 1)^2$

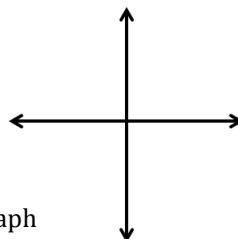
Lesson 2.2— Use the function, $f(x) = -x(x + 2)^3(x - 3)^3(x + 1)^2$ to answer the following.

- State the degree and leading coefficient
- Determine the real zeros.
- State the multiplicity of each zero.
- Graph the x-intercept points and sketch the polynomial graph



Lesson 2.2— Use the function, $f(x) = x^3 - x^2 - 4x + 4$ to answer the following.

- State the degree and leading coefficient
- Determine the real zeros.
- State the multiplicity of each zero.
- Graph the x-intercept points and sketch the polynomial graph



Lesson 2.3— Dividing using Long Division or Synthetic Division.

15. $(2x^5 - 15x^3 - 9x^2 + 11x + 12) \div (x + 2)$

16. $(x^4 - x^3 - 19x^2 - 3x - 19) \div (x - 5)$

17. $(10x^4 - 4x^3 + 14x^2 - 14x - 16) \div (2x - 2)$

18. $(9x^5 - 9x^4 - x^3 - 12x^2 + x - 11) \div (3x - 5)$

19. $(16x^4 + 4x^3 + 2x^2 - 13x + 7) \div (4x - 1)$

20. $(6x^5 + 21x^4 - 14x^3 - 8x^2 + x - 6) \div (x + 4)$

Lesson 2.3— Use the Rational Zero Test to list all possible rational zeros of f .

21. $f(x) = 4x^3 - 11x^2 + 10x - 3$

22. $f(x) = 10x^3 + 21x^2 - x - 6$

Lesson 2.3— Use Descartes' Rule of Signs to determine the possible numbers of +&- real zeros of the function.

23. $g(x) = 5x^3 - 6x + 9$

24. $f(x) = 2x^5 - 3x^2 + 2x - 1$

Lesson 2.4— Find .

25. $(2 - 4i)(-6 + 4i)$

28. $(3 + 3i) + (8 - 2i) - 7$

30. $\frac{-3+10i}{-2-6i}$

26. $(1 - 7i)^2$

29. $\frac{4-9i}{-6i}$

31. $\frac{2i}{2+3i}$

27. $(-3 + 6i) - (-5 - 3i) - 8i$

Lesson 2.5— A polynomial function with rational coefficients has the follow zeros, find the polynomial.

32. $-1, 1 + 3i$

33. $-3, -3, 2\sqrt{2}$

34. $1 - i, \sqrt{7}$

Lesson 2.5— Find all the zeros of the function and write the polynomial as a product of linear factors. .

33. $f(x) = x^4 - 16$

36. $f(x) = x^3 - 3x^2 + 4x - 2$

34. $f(x) = x^5 - 3x^4 + x^3 + x^2 + 4$

37. $f(x) = x^4 + 6x^3 + 18x^2 + 54x + 81$

35. $f(x) = x^3 + 4x^2 - 7x - 10$

38. $f(x) = 4x^2 + 25$