

Due: **A day: Wednesday, 10/14/15** **B day: Thursday, 10/15/15**

Pre-Calculus: Lesson 2.2 Polynomial Functions of Higher Degree Classwork p. 109 (*only odd*) #29-33, 37-43, 49-55, 59-63, 67, 71, 75-79.

Please complete the assignment using the “tri-fold” method (You may use www.calcchat.com to check your work):

Applying the Leading Coefficient Test In Exercises 29–36, use the Leading Coefficient Test to describe the right-hand and left-hand behavior of the graph of the polynomial function. Use a graphing utility to verify your result.

- ✓ 29. $f(x) = 2x^4 - 3x + 1$ 30. $h(x) = 1 - x^6$
✓ 31. $g(x) = 5 - \frac{7}{2}x - 3x^2$ 32. $f(x) = \frac{1}{3}x^3 + 5x$
33. $f(x) = \frac{6x^5 - 2x^4 + 4x^2 - 5x}{3}$

Finding Zeros of a Polynomial Function In Exercises 37–48, (a) find the zeros algebraically, (b) use a graphing utility to graph the function, and (c) use the graph to approximate any zeros and compare them with those from part (a).

- ✓ 37. $f(x) = 3x^2 - 12x + 3$ 38. $g(x) = 5x^2 - 10x - 5$
39. $g(t) = \frac{1}{2}t^4 - \frac{1}{2}$ 40. $y = \frac{1}{4}x^3(x^2 - 9)$
41. $f(x) = x^5 + x^3 - 6x$ 42. $g(t) = t^5 - 6t^3 + 9t$
43. $f(x) = 2x^4 - 2x^2 - 40$

Finding Zeros and Their Multiplicities In Exercises 49–58, find all the real zeros of the polynomial function. Determine the multiplicity of each zero. Use a graphing utility to verify your result.

49. $f(x) = x^2 - 25$ 50. $f(x) = 49 - x^2$
51. $h(t) = t^2 - 6t + 9$ 52. $f(x) = x^2 + 10x + 25$
53. $f(x) = x^2 + x - 2$ 54. $f(x) = 2x^2 - 14x + 24$
55. $f(t) = t^3 - 4t^2 + 4t$ 56. $f(x) = x^4 - x^3 - 20x^2$

Analyzing a Polynomial Function In Exercises 59–64, use a graphing utility to graph the function and approximate (accurate to three decimal places) any real zeros and relative extrema.

- ✓ 59. $f(x) = 2x^4 - 6x^2 + 1$
 60. $f(x) = -\frac{3}{8}x^4 - x^3 + 2x^2 + 5$
 ✓ 61. $f(x) = x^5 + 3x^3 - x + 6$
 62. $f(x) = -3x^3 - 4x^2 + x - 3$
 63. $f(x) = -2x^4 + 5x^2 - x - 1$

Finding a Polynomial Function with Given Zeros In Exercises 65–74, find a polynomial function that has the given zeros. (There are many correct answers.)

65. 0, 4
 66. -7, 2
 ✓ 67. 0, -2, -3
 68. 0, 2, 5
 69. 4, -3, 3, 0
 70. -2, -1, 0, 1, 2
 71. $1 + \sqrt{3}, 1 - \sqrt{3}$
 72. $6 + \sqrt{3}, 6 - \sqrt{3}$

Finding a Polynomial Function with Given Zeros In Exercises 75–80, find a polynomial function with the given zeros, multiplicities, and degree. (There are many correct answers.)

75. Zero: -2, multiplicity: 2
 Zero: -1, multiplicity: 1
 Degree: 3
 76. Zero: 3, multiplicity: 1
 Zero: 2, multiplicity: 3
 Degree: 4
 77. Zero: -4, multiplicity: 2
 Zero: 3, multiplicity: 2
 Degree: 4
 78. Zero: 5, multiplicity: 3
 Zero: 0, multiplicity: 2
 Degree: 5
 79. Zero: -1, multiplicity: 2
 Zero: -2, multiplicity: 1
 Degree: 3
 Rises to the left,
 Falls to the right
 80. Zero: 1, multiplicity: 2
 Zero: 4, multiplicity: 2
 Degree: 4
 Falls to the left,
 Falls to the right