Advanced Algebra   Name _____

Homework 5.3

Roots and Graphs of Polynomials using Graphing Calculator   Period _____

SHOW ALL WORK.

a. Determine the number of real and imaginary roots.
b. If real roots exist, find them. Round to nearest hundredth if necessary.
c. Identifywhere local maximums or local minimums occur.

1. $f(x) = x^2 - 4x + 7$ **2.** $f(x) = -2x^3 + 4x^2 - x + 1$

1a. _____   **2a.** _____

1b. _____   **2b.** _____

1c. _____   **2c.** _____

3. $f(x) = x^5 - 6x^3 + 9x$ **4.** $f(x) = x^4 - 2x^3 - 3x^2 + 5x + 2$

1a. _____   **2a.** _____

1b. _____   **2b.** _____

1c. _____   **2c.** _____

5. The retail space in shopping center in the United States from 1986 to 2003 can be modeled by
$S = -0.0388t^4 + 1.723t^3 - 28t^2 + 309t + 3481$ where S is the amount of retail space (in million of square feet) and t is the number of years since 1986.

    a.) Graph the function on the domain 0≤t≤17.

    b.) Use the graph to estimate the first year that the amount of retail space was greater than 5000 million square feet.

    c.) Use the model to predict the amount of retail space in the year 2010. Is it appropriate to use the model to make this prediction?

6. From 1998 to 2005, the sales S (in billions of dollars) of sporting goods can be modeled by $S = 0.007t^3 + 0.1t^2 + 1.4t + 70$ where t is the number of years since 1998. In which year were sales about $78 billion?

7. From 1980 to 2003, the total exports E (in billions of dollars) of the United States can be modeled by the function $E = -0.165t^3 + 6.023t^2 - 30.728t + 247.432$ where t is the number of years since 1980. In which year were the total exports about $584.7 billion?

Determine the least degree the function can have.

8.

9.

10.
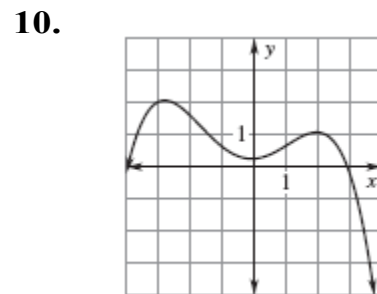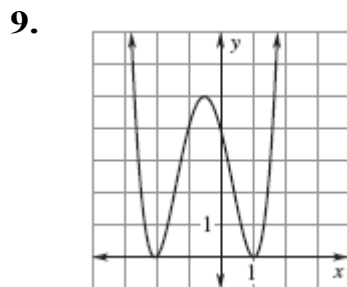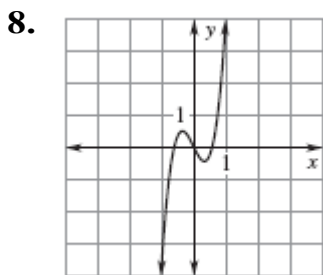
Homework 5.3 Answers

1a. 0 real, 2 imag.	**2a.** 1 real, 2 imag.	**3a.** 5 real, 0 imag.	**4b.** 4 real 0 imag.
1b. --	**2b.** 1.88	**3b.** -1.73 (double), 0, 1.73 (double)	**4b.** -1.53, -.35, 1.88, 2
1c. min (2, 3)	**2c.** min (.14, .93) max (1.19, 2.10)	**3c.** max (-1.73, 0) min (-.77, -4.46) max (.77, 4.46) min (1.73, 0)	**4c.** min (-1.05, -3.02) max (.61, 3.62) min (1.94, -.03)

5b. 1995   **5c.** 5,715,000,000   **6.** 2002   **7.** 1995   **8.** 3   **9.** 4   **10.** 4