

2.1-2.4

DATE \_\_\_\_\_

**2 Chapter Quiz**

NAME \_\_\_\_\_

1. Write an equation in standard form for the parabola that has vertex  $(3, -2)$  and passes through the point  $(1, 14)$ . **1.** \_\_\_\_\_
2. Draw the graph of  $f(x) = 0.05x^3 + 6x^2 - 2x - 3$  in the  $[-15, 10]$  by  $[-100, 175]$  viewing rectangle. How many real zeros are evident from this graph?  
**A.** 1                      **B.** 2  
**C.** 3                      **D.** 0  
**E.** Infinitely many **2.** \_\_\_\_\_
3. Describe the end behavior of the polynomial function  $f(x) = -6x^3 + 2x^2 + 3x - 8$ . **3.**  $f(x) \rightarrow$  \_\_\_\_\_ as  $x \rightarrow -\infty$ ;  
 $f(x) \rightarrow$  \_\_\_\_\_ as  $x \rightarrow \infty$
4. Use the Remainder Theorem to find the remainder when  $x^3 - 6x^2 + 5x - 2$  is divided by  $x - 6$ . **4.** \_\_\_\_\_
5. Find a polynomial of degree 3 whose zeros are  $-3, \frac{3}{2}, 2$ . **5.** \_\_\_\_\_  
**A.**  $2x^3 - x^2 - 15x - 18$   
**B.**  $2x^2 + 3x - 9$   
**C.**  $2x^2 - 7x + 6$   
**D.**  $2x^3 - x^2 - 15x + 18$   
**E.**  $2x^3 - 7x^2 - 15x + 18$
6. Use long division to find the remainder when  $x^4 - 3x^2 + 5x - 1$  is divided by  $x^2 - 3$ . **6.** \_\_\_\_\_
7. Use synthetic division to divide  $\frac{3x^3 - 2x^2 + 5x - 3}{x + 2}$ . **7.** \_\_\_\_\_  
Summarize your results by writing a fraction equation.  
 $\frac{3x^3 - 2x^2 + 5x - 3}{x + 2} =$  \_\_\_\_\_
8. A contractor purchases a new bulldozer for \$45,000. After 15 years the bulldozer will be outdated and have no value. Write a linear equation giving the value  $V$  of the equipment during the 15 years it will be used, where  $t$  is the number of years after purchase. **8.** \_\_\_\_\_

2.1-2.4

**2 Chapter Quiz** *(continued)*

NAME \_\_\_\_\_

**9.** The formula  $h = -16t^2 + v_0t + s_0$  gives the height of an object tossed upward where  $v_0$  represents the initial velocity,  $s_0$  represents the initial height, and  $t$  represents time. A golf ball is hit straight up from the ground level with an initial velocity of 72 ft/sec. Find the maximum height that the ball reaches and the number of seconds it takes to reach that height.

**9.** Max. ht. = \_\_\_\_\_

Time = \_\_\_\_\_

**10.** The manager of 100 apartments knows that at \$600 rent per month, all apartments will be rented. For each \$25 increase, one apartment will not be occupied. Let  $x$  represent the number of \$25 increases to the rent.

**(a)** Write the revenue as a function of  $x$ .**(b)** What rent per unit will yield maximum revenue?**(c)** What is the maximum revenue?**10. (a)** \_\_\_\_\_**(b)** \_\_\_\_\_**(c)** \_\_\_\_\_

2.5-2.8

DATE \_\_\_\_\_

**2 Chapter Quiz**

NAME \_\_\_\_\_

1. Find the domain of  $f(x) = \frac{x^3 + 5x^2 - 2}{x^2 - 2}$ .

1. \_\_\_\_\_

- A.  $(-\infty, -2) \cup (-2, 2)$   
 B.  $(-\infty, -2) \cup (-2, 2) \cup (2, \infty)$   
 C.  $(-\infty, -\sqrt{2}) \cup (-\sqrt{2}, \sqrt{2})$   
 D.  $(-\infty, -\sqrt{2}) \cup (-\sqrt{2}, \sqrt{2}) \cup (\sqrt{2}, \infty)$   
 E.  $(-\infty, \infty)$

2. Find all rational zeros of  $f(x) = 2x^3 - x^2 - 23x - 20$ .

2. \_\_\_\_\_

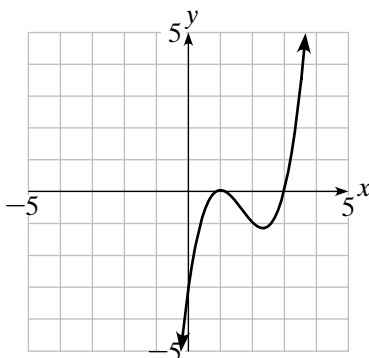
3. Find all the zeros of  $f(x) = x^4 - x^3 - x^2 - x - 2$ .

3. \_\_\_\_\_

4. Write a linear factorization of  $f(x) = x^3 + 6x - 7$ .

4. \_\_\_\_\_

5. Which of the following gives the zeros of the graph and their multiplicity?



5. \_\_\_\_\_

- A. 1 (multiplicity 1), 3 (multiplicity 2)  
 B. 1 (multiplicity 3), 2 (multiplicity 1)  
 C. 1 (multiplicity 3), 3 (multiplicity 1)  
 D. 1 (multiplicity 2), 3 (multiplicity 1)  
 E. 1 (multiplicity 1), 2 (multiplicity 3)

6. Solve the inequality  $\frac{x + 5}{|x - 2|} \leq 0$ .

6. \_\_\_\_\_

2.5-2.8

**2 Chapter Quiz** *(continued)*

NAME \_\_\_\_\_

7. Solve the rational equation  $\frac{x(2x + 1)}{x - 2} = \frac{10}{x - 2} - \frac{5}{2}$ .

7. Root: \_\_\_\_\_

Extraneous root: \_\_\_\_\_

8. Find a polynomial of degree 2 with real-number coefficients and zero  $3 - 2i$ .

8. \_\_\_\_\_

9. Solve the inequality  $\frac{3x + 2}{(x + 1)(2x)} \leq 0$ .

9. \_\_\_\_\_

10. Find all the asymptotes and the intercepts of the

$$\text{function } f(x) = \frac{x^2 - 3x + 5}{x + 2}.$$

10. \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

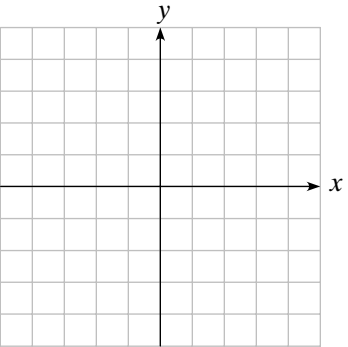
FORM A

DATE \_\_\_\_\_

**2 Chapter Test**

NAME \_\_\_\_\_

Directions: Show all work where appropriate. A graphing calculator may be necessary to answer some questions.

- Divide  $x^3 - 2x^2 + 4x - 2$  by  $x - 3$ .
  - Quotient: \_\_\_\_\_
  - Remainder: \_\_\_\_\_
- What is the remainder when  $x^{29} - 7x^{14} + 8$  is divided by  $x - 1$ ?
  - \_\_\_\_\_
- An antique vase is projected to be worth \$1,000 in 2 years and \$1,300 after 5 years. If the value of the vase continues to appreciate at this same rate, what will it be worth in 8 years?
  - \_\_\_\_\_
- Which one of the following is a polynomial with *real* coefficients that has 2 and  $2 - i$  as zeros?
  - $(x + 2)(x - 2 - i)$
  - $(x - 2)(x + 2 + i)$
  - $(x + 2)(x^2 - 4x + 5)$
  - $(x - 2)(x^2 - 4x + 5)$
  - $(x + 2)(x^2 + 5)$
- Find all zeros of  $f(x) = x^3 - x^2 + x - 21$  and write a linear factorization of  $f(x)$ .
  - Zeros: \_\_\_\_\_
  - $f(x) =$  \_\_\_\_\_
- What is the minimum value for the function  $y = 2x^2 - 32x + 256$ ?
  - \_\_\_\_\_
- The line  $x = 3$  is the axis of symmetry for the graph of a parabola. If the parabola contains the points  $(1, 0)$  and  $(4, -3)$ , what is the equation for the parabola?
  - \_\_\_\_\_
- A photograph is 4 in. longer than it is wide. If the frame is 2 in. wide, the combined area of the photograph and the frame is  $252 \text{ in.}^2$ . Find the dimensions of the photograph without the frame.
  - \_\_\_\_\_
- Graph the function  $2x^4 - 3x^3 - 4x^2 + 2x + 2$ . Choose a viewing window that shows three local extremum values and all the  $x$ -intercepts. Make a sketch of the grapher window, and show the viewing window dimensions.
 

FORM A

**2 Chapter Test** *(continued)*

NAME \_\_\_\_\_

**10.** Describe the end behavior of the polynomial function  $f(x) = -2x^4 - 3x^3 + 3x - 5$ .

**10.**  $f(x) \rightarrow$  \_\_\_\_\_ as  $x \rightarrow -\infty$ ;  
 $f(x) \rightarrow$  \_\_\_\_\_ as  $x \rightarrow \infty$

**11.** Identify the horizontal and vertical asymptotes for the function  $f(x) = \frac{3x^2}{x^2 - 7x + 12}$ .

**11.** Horizontal: \_\_\_\_\_  
 Vertical: \_\_\_\_\_

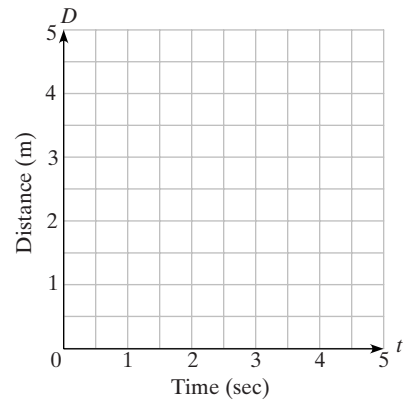
**12.** Solve the inequality  $\frac{x - 6}{|2x - 4|} \leq 0$ .

**12.** \_\_\_\_\_

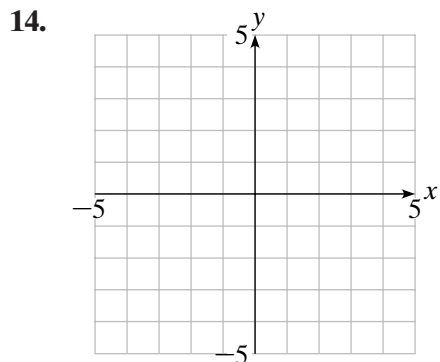
**13.** Raymond's distance  $D$  from a motion detector is given by the data below. Find a cubic regression equation (with coefficients expressed to the nearest thousandth), and graph it together with a scatter plot of the data.

$t(\text{sec})$	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
$D(m)$	2.8	3.9	4.3	4.0	3.3	2.5	1.8	1.2	0.9	1.6	2.7

**13.** \_\_\_\_\_



**14.** In the space below, identify all asymptotes and intercepts of the function  $g(x) = \frac{x - 5}{x^2 + x - 6}$ . Then sketch a graph of  $g(x)$ .



**15.** Tell how the graph of  $y = -3 + \frac{4}{x + 2}$  can be obtained from the graph of  $y = \frac{1}{x}$  by using transformations.

**15.** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**16.** Solve the inequality  $\frac{(x - 5)^3}{x(x + 2)} \geq 0$ .

**16.** \_\_\_\_\_

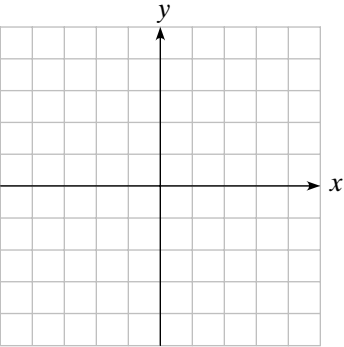
FORM B

DATE \_\_\_\_\_

**2 Chapter Test**

NAME \_\_\_\_\_

Directions: Show all work where appropriate. A graphing calculator may be necessary to answer some questions.

1. Divide  $x^3 + 3x^2 - 8x + 7$  by  $x - 2$ .
  1. Quotient: \_\_\_\_\_
  - Remainder: \_\_\_\_\_
2. What is the remainder when  $x^{32} - 5x^{15} + 12$  is divided by  $x + 1$ ?
  2. \_\_\_\_\_
3. The value of an antique chair is projected to appreciate \$60 each year. If the chair will be worth \$650 in 2 years, what will it be worth in 10 years?
  3. \_\_\_\_\_
4. Which one of the following is a polynomial with *real* coefficients that has  $-2$  and  $2 + i$  as zeros?
  - A.  $(x + 2)(x - 2 - i)$
  - B.  $(x - 2)(x + 2 + i)$
  - C.  $(x + 2)(x^2 - 4x + 5)$
  - D.  $(x - 2)(x^2 - 4x + 5)$
  - E.  $(x + 2)(x^2 + 5)$
  4. \_\_\_\_\_
5. Find all zeros of  $f(x) = x^3 + 7x - 22$  and write a linear factorization of  $f(x)$ .
  5. Zeros: \_\_\_\_\_
  - $f(x) =$  \_\_\_\_\_
6. What is the minimum value for the function  $y = 3x^2 - 60x + 194$ ?
  6. \_\_\_\_\_
7. The line  $x = 3$  is the axis of symmetry for the graph of a parabola. If the parabola contains the points  $(5, -3)$  and  $(-1, 9)$ , what is the equation for the parabola?
  7. \_\_\_\_\_
8. A swimming pool is 8 ft longer than it is wide. The pool is surrounded by a walkway of width 4 ft. The combined area of the pool and the walkway is  $1280 \text{ ft}^2$ . Find the dimensions of the pool without the walkway.
  8. \_\_\_\_\_
9. Graph the function  $y = -3x^4 + 2x^3 + 6x^2 - 5x + 1$ . Choose a viewing window that shows three local extremum values and all the  $x$ -intercepts. Make a sketch of the grapher window, and show the viewing window dimensions.
  9. 

FORM B

**2 Chapter Test** *(continued)*

NAME \_\_\_\_\_

**10.** Describe the end behavior of the polynomial function  $f(x) = -3x^5 + 2x^4 + 5x - 3$ .

**10.**  $f(x) \rightarrow$  \_\_\_\_\_ as  $x \rightarrow -\infty$ ;  
 $f(x) \rightarrow$  \_\_\_\_\_ as  $x \rightarrow \infty$

**11.** Identify the horizontal and vertical asymptotes for the function  $f(x) = \frac{5x^2}{2x^2 - 11x + 12}$ .

**11.** Horizontal: \_\_\_\_\_  
 Vertical: \_\_\_\_\_

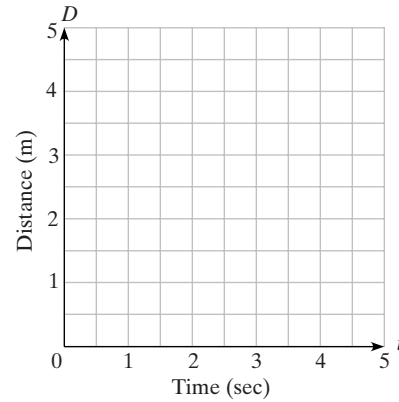
**12.** Solve the inequality  $(x - 4)\sqrt{x + 2} \geq 0$ .

**12.** \_\_\_\_\_

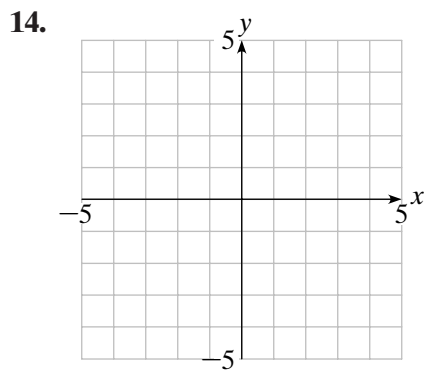
**13.** Jennifer's distance  $D$  from a motion detector is given by the data below. Find a cubic regression equation (with coefficients expressed to the nearest thousandth), and graph it together with a scatter plot of the data.

**13.** \_\_\_\_\_

$t(\text{sec})$	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
$D(m)$	2.2	1.1	0.7	1.0	1.7	2.5	3.3	4.0	4.4	3.8	2.8



**14.** In the space below, identify all asymptotes and intercepts of the function  $g(x) = \frac{x + 6}{x^2 + x - 12}$ . Sketch a graph of  $g(x)$ .



**15.** Tell how the graph of  $y = 5 + \frac{2}{x - 4}$  can be obtained from the graph of  $y = \frac{1}{x}$  by using transformations.

**15.** \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**16.** Solve the inequality  $\frac{(x - 4)^3}{x(x + 3)} \leq 0$ .

**16.** \_\_\_\_\_