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?

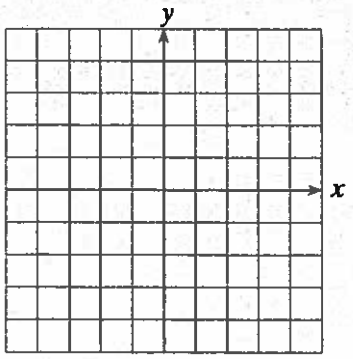
7. _____

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 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.



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

10. $f(x) \to$ _____ as $x \to -\infty$;
$f(x) \to$ _____ as $x \to \infty$

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

11. Horizontal: _____
Vertical: _____

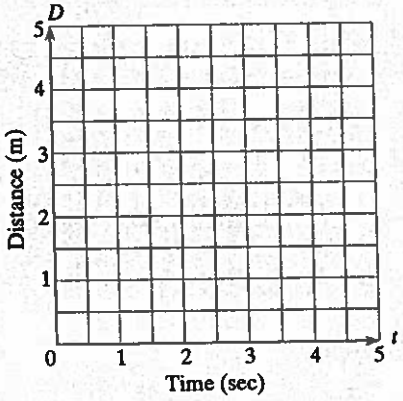
12. Solve the inequality $(x - 4)\sqrt{x + 2} \geq 0$.

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.

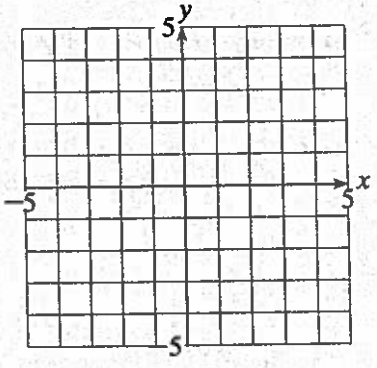
t(sec)	0.0	0.5	1.0	1.5	2.0	2.5	3.0	3.5	4.0	4.5	5.0
$D(m)$	2.2	1.1	0.7	1.0	1.7	2.5	3.3	4.0	4.4	3.8	2.8

13. _____



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

14.



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

15. _____
_____
_____

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

16. _____