Name _____ Date _____ Class _____

LESSON 7-1

Finding Rational Solutions of Polynomial Equations

Practice and Problem Solving: C

Solve each polynomial equation by factoring.

1. $-3x^4 + 6x^3 + 105x^2 = 0$

2. $8x^7 - 56x^6 + 96x^5 = 0$

Identify the rational zeros of each function. Then write the function in factored form.

3. $f(x) = x^3 + 6x^2 + 12x - 8$

4. $f(x) = x^3 + 10x^2 + 32x + 32$

Identify all the rational roots of each equation.

5. $x^3 + 2x^2 - 48x = 0$

6. $5x^4 + 19x^3 - 29x^2 + 5x = 0$

7. $6x^3 + 12x^2 - 18x = 0$

8. $3x^4 + 5x^3 - 11x^2 + 3x = 0$

Solve.

9. A jewelry box is designed such that its length is twice its width and its depth is 2 inches less than its width. The volume of the box is 64 cubic inches.

   a. Write an equation to model the volume of the box.

   b. List all possible rational roots. _____

   c. Use synthetic division to find the roots of the polynomial equation. Are the roots all rational numbers?

   d. What are the dimensions of the box? _____