Name _____ Date _____ Class _____

Practice C

Finding Real Roots of Polynomial Equations

Solve each polynomial equation by factoring.

1. $-2x^3 + 6x^2 + 108x = 0$

2. $4x^3 - 36x^2 + 64x = 0$

Identify the roots of each equation. State the multiplicity of each root.

3. $x^4 + 6x^3 + 12x + 8 = 0$

4. $x^4 + 10x^3 + 32x + 32 = 0$

Identify all the real roots of each equation.

5. $x^4 + 2x^3 - 48x = 0$

6. $x^4 - 13x^3 + 55x^2 - 91x + 18 = 0$

7. $6x^4 + 12x^3 - 18x = 0$

8. $x^4 + 6x^3 + 7x^2 - 32x + 8 = 0$

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?