

**Practice G**  
**Finding Real Roots of Polynomial Equations**

Solve each polynomial equation by factoring.

1.  $-3x^2 + 4x^2 + 100x^2 = 0$

2.  $8x^2 + 96x^2 + 144x^2 = 0$

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

3.  $x^2 + 5x^2 + 10x + 8 = 0$

4.  $x^2 + 10x^2 + 35x + 32 = 0$

Identify all the real roots of each equation.

5.  $x^2 + 2x^2 - 40x = 0$

6.  $x^2 + 10x^2 + 25x^2 - 50x + 18 = 0$

7.  $8x^2 + 52x^2 + 78x = 0$

8.  $x^2 + 8x^2 + 7x^2 + 32x + 8 = 0$

**Notes:**

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 84 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?