

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

Solve each polynomial equation by factoring.

1.  $-3x^4 + 6x^3 + 105x^2 = 0$   
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2.  $8x^7 - 56x^6 + 96x^5 = 0$   
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Identify the roots of each equation. State the multiplicity of each root.

3.  $x^3 + 6x^2 + 12x - 8 = 0$   
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4.  $x^3 + 10x^2 + 32x + 32 = 0$   
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Identify all the real roots of each equation.

5.  $x^3 + 2x^2 - 48x = 0$   
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6.  $x^4 - 13x^3 + 55x^2 - 81x + 18 = 0$   
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7.  $6x^3 + 12x^2 - 18x = 0$   
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8.  $x^4 + 8x^3 + 7x^2 - 22x + 6 = 0$   
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**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.  
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b. List all possible rational roots. \_\_\_\_\_

c. Use synthetic division to find the roots of the polynomial equation.  
Are the roots all rational numbers?  
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d. What are the dimensions of the box? \_\_\_\_\_

## Practice C

1.  $-5, 0, 7$
2.  $0, 3, 4$
3.  $x = 2$  with multiplicity 3
4.  $x = -4$  with multiplicity 2;  $x = -2$  with multiplicity 1
5.  $-8, 0, 6$
6.  $3, 6, 2 \pm \sqrt{3}$
7.  $-3, 0, 1$
8.  $-3, 1, -3 \pm \sqrt{11}$
9. a.  $2x^3 - 4x^2 - 64 = 0$ 
  - b.  $\pm 1, \pm 2, \pm 4, \pm 8, \pm 16, \pm 32, \pm 64$
  - c.  $4, -1 \pm i\sqrt{7}$ ; no, 2 of the roots are irrational numbers.
  - d. 4 in. wide, 8 in. long, and 2 in. deep