

## LESSON

## 7-1

**Finding Rational Solutions of Polynomial Equations****Practice and Problem Solving: A/B**

Solve each polynomial equation by factoring.

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

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2.  $x^5 - 2x^4 - 24x^3 = 0$

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3.  $3x^5 + 18x^4 - 21x^3 = 0$

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

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

5.  $f(x) = x^3 + 3x^2 + 3x + 1$

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6.  $f(x) = x^3 + 5x^2 - 8x - 48$

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Identify all the rational roots of each equation.

7.  $x^3 + 10x^2 + 17x = 28$

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8.  $3x^3 + 10x^2 - 27x = 10$

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Solve.

9. An engineer is designing a storage compartment in a spacecraft. The compartment must be 2 meters longer than it is wide, and its depth must be 1 meter less than its width. The volume of the compartment must be 8 cubic meters.

- a. Write an equation to model the volume of the compartment.

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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 storage compartment? \_\_\_\_\_