

**LESSON 4.2** Assignment

Name \_\_\_\_\_ Date \_\_\_\_\_

**The Great Polynomial Divide**  
**Polynomial Division**

1. The given table of values represents the function  $f(x) = x^3 + 9x^2 + 14x - 24$ .

$x$	-2	-1	0	1	2
$f(x)$	-24	-30	-24	0	48

- a. Determine one of the factors of  $f(x)$  without using a calculator. Explain your reasoning.
- b. Completely factor  $f(x)$  without using a calculator.

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- c. Determine all of the zeros of  $f(x)$  without using a calculator.

2. Determine whether  $2x - 4$  is a factor of  $m(x) = 2x^4 - 8x^2 + 4$ .

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3. The Polynomial Pool Company offers 10 different pool designs numbered 1 through 10. Each pool is in the shape of a rectangular prism. The volume of water in Pool Design  $x$ , can be determined using the function  $V(x) = \ell(x) \cdot w(x) \cdot d(x) = 2x^3 + 18x^2 + 46x + 30$ , where  $\ell(x)$ ,  $w(x)$ , and  $d(x)$  represent the length, width, and depth of the pool in feet.
- a. Determine the expressions for the functions  $w(x)$  and  $d(x)$  if  $\ell(x) = 2x + 2$  and the width of each pool is greater than the depth. Do not use a calculator.

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- b. Determine the length, width, and depth of Pool Design 9.

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4. Determine whether  $3x + 3$  is a factor of  $p(x) = 3x^4 + 3x^3 - 6x^2 - 6x$ .

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