

## Exit Ticket Sample Solutions

Find the quotient. Justify your answer.

$$\frac{x^5 + 2x^4 - 7x^2 - 19x + 15}{x^2 + 2x + 5}$$

The quotient is  $x^3 - 5x + 3$ .

	$x^3$	$0x^2$	$-5x$	$3$	
	$x^5$	$0x^4$	$-5x^3$	$3x^2$	$x^2$
$x^5$	$2x^4$	$0x^3$	$-10x^2$	$6x$	$2x$
$2x^4$	$5x^3$	$0x^2$	$-25x$	$15$	$5$
$0x^3$	$-7x^2$	$-19x$	$15$		

## Homework Problem Set Sample Solutions

Use the reverse tabular method to solve these division problems.

1.  $\frac{2x^3 + x^2 - 16x + 15}{2x - 3}$

$x^2 + 2x - 5$

2.  $\frac{(3x^5 + 12x^4 + 11x^3 + 2x^2 - 4x - 2)}{(3x^2 - 1)}$

$x^3 + 4x^2 + 4x + 2$

3.  $\frac{x^3 - 4x^2 + 7x - 28}{x^2 + 0x + 7}$

$x - 4$

4.  $\frac{x^3 + 2x^2 + 2x + 1}{x + 1}$

$x^2 + x + 1$

5.  $\frac{x^4 + 2x^3 + 2x^2 + 2x + 1}{x + 1}$

$x^3 + x^2 + x + 1$

6.  $\frac{x^4 - 2x^3 - 29x - 12}{x^3 + 2x^2 + 8x + 3}$

$x - 4$

7.  $\frac{6x^5 + 4x^4 - 6x^3 + 14x^2 - 8}{6x + 4}$

$x^4 - x^2 + 3x - 2$

8.  $\frac{(x^3 - 8)}{(x - 2)}$

$x^2 + 2x + 4$

9. In Homework Practice Set #4 you should have gotten an answer of  $x^2 + x + 1$  and in Homework Practice Set #5 you should have gotten an answer of  $x^3 + x^2 + x + 1$ .

A. Use those answers and the patterns in the original problems to predict the quotient of

$$\frac{x^5 + 2x^4 + 2x^3 + 2x^2 + 2x + 1}{x + 1}$$

- The quotient is  $x^4 + x^3 + x^2 + x + 1$ .

B. Explain your prediction.

- The result is a polynomial of degree one less than the dividend where all the coefficients were 1. The dividend in this problem has the same structure except it was degree 5, and it is also divided by  $x + 1$ .

C. Then check your prediction using the reverse tabular method.

- The quotient is  $x^4 + x^3 + x^2 + x + 1$ .

### Challenge

10. Use the results of Homework Practice Set #9 to predict the quotient of  $\frac{x^6 + x^5 + 2x^4 + 2x^3 + 2x^2 + x + 1}{x^2 + 1}$ . Explain your prediction. Then check your prediction using the reverse tabular method.

- The quotient is  $x^4 + x^3 + x^2 + x + 1$ . Since we are missing the  $x$  term, there will not be two  $x^5$  or two  $x$  terms. Otherwise it will follow the same pattern as Problems 4 and 5.

11. Consider the following quotients:

$$\frac{4x^2 + 8x + 3}{2x + 1} \text{ and } \frac{483}{21}$$

- a. How are these expressions related?

If we let  $x = 10$ , then  $4x^2 + 8x + 3 = 4(10^2) + 8(10) + 3 = 483$  and  $2x + 1 = 2(10) + 1 = 21$ , so  $\frac{4x^2 + 8x + 3}{2x + 1} = \frac{483}{21}$ .

- b. Find each quotient.

$$\frac{4x^2 + 8x + 3}{2x + 1} = 2x + 3 \text{ and } \frac{483}{21} = 23$$

- c. Explain the connection between the quotients.

If we let  $x = 10$ , then  $2x + 3 = 2(10) + 3 = 23$ .