Algebra 2 Unit 3 worksheet: Synthetic division

Name _____ Date _____ Period _____

1. Set up each synthetic division, but do not divide: write the corner number c and the top row of coefficients, highest power first.

(a) $(x^3 - 5x + 2) \div (x + 4)$

(b) $(x^5 - 3x^2) \div (x + 1)$

(c) $(6x^3 + 5x - 1) \div (2x + 1)$

(d) $(7x - x^4) \div (x + 2)$

2. Use synthetic division to divide $x^3 + 9x^2 + 24x + 24$ by $x + 5$. Give the quotient and the remainder.

3. Use synthetic division to divide $-2x^4 + 2x^2 - 12$ by $x - 2$. Give the quotient and the remainder.

4. Use synthetic division to divide $6x^3 + 13x^2 + 10x - 6$ by $3x - 1$. Give the quotient and the remainder.

5. Layla divided $3x^3 + 4x^2 - 5x + 1$ by $x + 2$. Her tableau is below, and she wrote that the quotient is $3x^2 + 10x + 15$ with remainder 31.

2	3	4	-5	1
		6	20	30
	3	10	15	31

(a) What did Layla do wrong? Her arithmetic is correct, so her tableau does divide $3x^3 + 4x^2 - 5x + 1$ by some divisor: which one?

(b) Divide by $x + 2$ correctly, and check your answer by multiplying.

Free sample from math.wiki for classroom use. Do not post. math.wiki

6. Let $p(x) = x^3 - 4x^2 + 7x - 1$.

(a) Divide $p(x)$ by $x - 2$. Call the quotient $q_1(x)$ and the remainder r_1.

(b) Divide $q_1(x)$ by $x - 2$. Call the quotient $q_2(x)$ and the remainder r_2.

(c) Divide $q_2(x)$ by $x - 2$. Call the remainder r_3.

(d) Use your three divisions to write $p(x)$ in powers of $(x - 2)$, as $p(x) = (x - 2)^3 + A(x - 2)^2 + B(x - 2) + C$. Explain how the numbers A, B and C come from your work.

7. Some entries of this synthetic division were smudged; each $\square$ is one lost number. Fill in every entry, then write the divisor, the dividend, the quotient and the remainder.

$\square$	3	11	$\square$	-2	$\square$
		-6	$\square$	8	$\square$
	3	$\square$	-4	$\square$	-11

Free sample from math.wiki for classroom use. Do not post. math.wiki