• Graph polynomial on calculator

Advanced Algebra 2 **Name** Key

Quiz #5-1 Review Worksheet (Sections 5.1 – 5.4)

5.1 Know when to add, subtract, and multiply powers and what to do with negative exponents.

Completely simplify each expression.

1) $(3x^{-2}y^6)(-5x^2y^3)$

$-15y^9$

2) $(-2x^4y^3)^2$

$(-2)^2x^8y^6$

$4x^8y^6$

3) $\frac{24x^5}{10x^8}$

$\frac{12}{5x^3}$

4) $\left(\frac{4x^2}{y^{-4}}\right)^{-3} = \frac{(4x^2)^{-3}}{(y^{-4})^{-3}} = \frac{4^{-3}x^{-6}}{y^{12}}$

$\frac{1}{4^3x^6y^{12}} = \frac{1}{64x^6y^{12}}$

Review operations with S.N.

5) Use synthetic division to evaluate the function for the given value of x. Show your work.

✓ for all terms by decreasing exponents

$f(x) = 8x^4 + 12x^3 + 6x^2 - 5x + 9$; x = -2

-2	8	12	6	-5	9
		-16	8	-28	66
	8	-4	14	-33	75

$f(-2) = 75$

Tell the direction y is heading, up or down, as x moves left and right.

Describe the end behavior of the graph of the polynomial function WITHOUT graphing.

6) $f(x) = 3x^5 - 2x^3 + 7$

$f(x) \to \underline{+\infty}$ as $x \to +\infty$

$f(x) \to \underline{-\infty}$ as $x \to -\infty$

7) $f(x) = 5x^4 - 7x + 45$

$f(x) \to \underline{+\infty}$ as $x \to +\infty$

$f(x) \to \underline{+\infty}$ as $x \to -\infty$

Find each sum or difference.

8) $(3x^2 - 7x + 5) + (-6x^3 + 2x + 3)$

$-6x^3 + 3x^2 - 5x + 8$

9) $(-7x + 2x^3 + 5x^4) + (3x^3 + 4x^4 + 8)$

$9x^4 - x^3 - 7x + 8$

Find the product. Show your work.

10) $(x + 7)(x - 10)(3x - 2)$

$(x^2 - 3x - 70)(3x - 2)$

	x^2	$-3x$	-70
$3x$	$3x^3$	$-9x^2$	$-210x$
-2	$-2x^2$	$6x$	140

$3x^3 - 11x^2 - 204x + 140$

11) $(3x^2 - 5x + 2)(4x^2 + 2x - 5)$

	$3x^2$	$-5x$	2
$4x^2$	$12x^4$	$-20x^3$	$8x^2$
$2x$	$6x^3$	$-10x^2$	$4x$
-5	$-15x^2$	$25x$	-10

$12x^4 - 14x^3 - 17x^2 + 29x - 10$

Factor each polynomial completely.

12) $\frac{16x^3}{8x^2} + \frac{24x^2}{8x^2}$

$8x^2(2x + 3)$

13) $\frac{x^3}{x} - \frac{7x^2}{x} + \frac{10x}{x}$

$x(1x^2 - 7x + 10)$

$x(x - 5)(x - 2)$

14) $x^3 + 64$

$(x + 4)(x^2 - 4x + 16)$

15.5) $(2x - 2)^3$

$(2x)^3 - 3(2x)^2 \cdot 2 + 3(2x)(2)^2 - (2)^3$

$8x^3 - 24x^2 + 24x - 8$

15) $x^3 + 3x^2 - 25x - 75$

	x	3
x^2	x^3	$3x^2$
-25	$-25x$	-75

$(x + 3)(x^2 - 25)$

$(x + 3)(x - 5)(x + 5)$

Factor and solve each equation.

16) $3x^5 - 12x^3 - 135x = 0$

$3x(x^4 - 4x^2 - 45) = 0$

$3x(x^2 - 9)(x^2 + 5) = 0$

$3x(x - 3)(x + 3)(x^2 + 5) = 0$

$3x = 0 \quad x - 3 = 0 \quad x + 3 = 0 \quad x^2 + 5 = 0$

$-5 \quad -5$

$x^2 = \sqrt{-5}$

$x = 0 \quad x = 3 \quad x = -3 \quad x = \pm i\sqrt{5}$

17) $x^3 - 5x^2 - 16x + 80 = 0$

	x	-5
x^2	x^3	$-5x^2$
-16	$-16x$	80

$(x - 5)(x^2 - 16) = 0$

$(x - 5)(x + 4)(x - 4) = 0$

$x = 5, -4, 4$