

Name key
Period _____
Date _____

Algebra IIB
Review 6.1-6.3

I. Perform the indicated operations and simplify completely. Use only positive exponents in your answers!

1.) $(5^2)^3$
 5^6
 15625

2.) $(8m^3)(-7m^5)$
 $-56m^8$

3.) $\frac{2^{-4} \cdot 2^5}{2^{-3}}$
 $\frac{2}{2^{-3}} = 2 \cdot 2^3 = 2^4$
 $= 16$

4.) $\left(\frac{2}{3}\right)^{-3}$
 $\frac{3^3}{2^3} = \frac{27}{8}$

5.) $(-3b^5c)^4(-4b^0c)$
 $((-3)^4 b^{20} c^4)(-4 \cdot 1 \cdot c)$
 $(81b^{20}c^4)(-4c)$
 $-324b^{20}c^5$

6.) $\frac{xy}{4} \cdot \frac{2x^2}{y^3}$
 $\frac{2x^3y}{4y^3} = \frac{x^3}{2y^2}$

7.) $\frac{(3^2)^3}{3^{-1}}$
 $= \frac{3^6}{3^{-1}}$
 $= 3^6 \cdot 3$
 $= 3^7$
 $= 2187$

pd 4/5:
8.) $\frac{2^{-4} \cdot 2^5}{2^{-3}} = \frac{2}{2^{-3}} = 2 \cdot 2^3 = 16$

pd 7/8: $\frac{(-2)^4(-2)^{-1}}{(-2)^3} = \frac{(-2)^3}{(-2)^3}$
 $= 1$

II. Polynomial Functions

- 9.) Determine whether the function is a polynomial function. If it is, write the function in standard form and state its degree and leading coefficient.

Yes/No a.) $f(x) = 1/3x^5 - 8 + 5x$

no variable in exp.

Degree: _____
Leading Coefficient: _____

Yes/No b.) $f(x) = 2x^4 - 7x^7 + 5 - x^5$

$$f(x) = -7x^7 - x^5 + 2x^4 + 5$$

Degree: 7
Leading Coefficient: -7

Yes/No c.) $f(x) = 3x^6 + 2 - 5x^{-3} + x^2$

no neg. exponents

Degree: _____
Leading Coefficient: _____

- 10.) Evaluate the polynomial function for the given value of x using any method.

a. $f(x) = 2x^4 + x^3 - 3x^2 + 6$ for $x = -2$

$$\begin{aligned} f(-2) &= 2(-2)^4 + (-2)^3 - 3(-2)^2 + 6 \\ &= 2(16) - 8 - 3(4) + 6 \\ &= 32 - 8 - 12 + 6 \\ &= 20 - 2 = \boxed{18} \end{aligned}$$

-2	2	1	-3	0	6	$f(-2) = 18$
	↓	-4	6	-6	12	
		2	-3	3	-6	

b. $f(x) = 3x^4 - 2x^2 + 5$ for $x = 2$

$$\begin{aligned} f(2) &= 3(2)^4 - 2(2)^2 + 5 \\ &= 3(16) - 2(4) + 5 \\ &= 48 - 8 + 5 = \boxed{45} \end{aligned}$$

2	3	0	-2	0	5	$f(2) = 45$
	↓	6	12	20	40	
		3	6	10	20	

c. $f(x) = -2x^5 + 3x^4 + x^3 - x^2 + 6x + 3$ for $x = -1$

$$\begin{aligned} f(-1) &= -2(-1)^5 + 3(-1)^4 + (-1)^3 - (-1)^2 + 6(-1) + 3 \\ &= -2(-1) + 3(1) - 1 - 1 - 6 + 3 \\ &= 2 + 3 - 2 - 3 \\ &= 5 - 5 = \boxed{0} \end{aligned}$$

-1	-2	3	1	-1	6	3	$f(-1) = 0$
	↓	2	-5	4	-3	-3	
		-2	5	-4	3	3	

d. $f(x) = \frac{1}{2}x^2 - x + 3$ for $x = -4$

$$\begin{aligned} f(-4) &= \frac{1}{2}(-4)^2 - (-4) + 3 \\ &= \frac{1}{2}(16) + 4 + 3 \\ &= 8 + 7 = \boxed{15} \end{aligned}$$

-4	½	-1	3	$f(-4) = 15$
	↓	-2	12	
		½	-3	

III. Operations with Polynomials: Perform the indicated operation and simplify, if appropriate:

11.) $(3x^3 - 2x^2 + x - 1) + (x^2 + 2x + 3)$
 $3x^3 - x^2 + 3x + 2$

12.) $(6x^3 + 3x^2 - 5x - 1) - (7x^3 + 3x - 6)$
 $-x^3 + 3x^2 - 8x + 5$

13.) $(9x^3 - 4 + x^2 + 8x) - (7x^3 - 3x + 7)$
 $2x^3 + x^2 + 11x - 11$

14.) FOIL
 $(8x - 5y)(8x + 5y)$
 $64x^2 - 25y^2$

15.) $(4x - 1)(6x^2 - 7x + 2)$
 $24x^3 - 34x^2 + 15x - 2$

16.) $(n + 2z)^3$ FOIL
 $(n + 2z)(n + 2z)(n + 2z)$
 $(n + 2z)(n^2 + 2nz + 2nz + 4z^2)$
 $(n + 2z)(n^2 + 4nz + 4z^2)$
 $n^3 + 6n^2z + 12nz^2 + 8z^3$

18.) FOIL
 $(2x - 3)(2x - 5)(x - 1)$

$(2x - 3)(2x^2 - 2x - 5x + 5)$
 $(2x - 3)(2x^2 - 7x + 5)$
 $4x^3 - 20x^2 + 31x + 2$

17.) $(2y - 5)^2$
 $(2y - 5)(2y - 5)$
 $4y^2 - 10y - 10y + 25$
 $4y^2 - 20y + 25$

