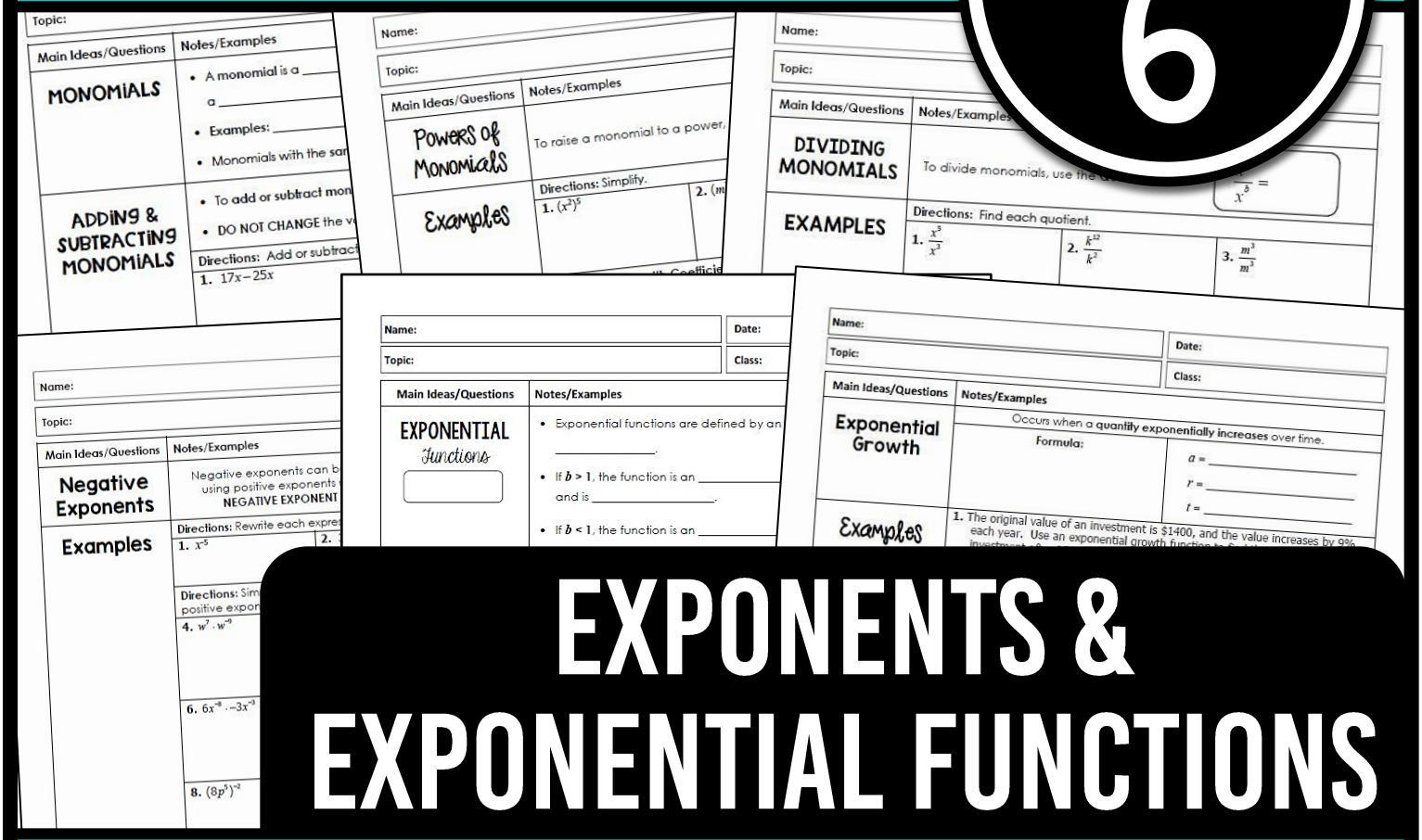
ALGEBRA I

Unit 6



EXPONENTS & EXPONENTIAL FUNCTIONS

NOTES • HOMEWORK • QUIZZES • TEST

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Unit 6 – Exponents & Exponential Functions: Sample Unit Outline

	TOPIC	HOMEWORK
DAY 1	Monomials: Add, Subtract, Multiply (Product Rule)	HW #1
DAY 2	Power Rule & Geometric Applications	HW #2
DAY 3	Quotient Rule	HW #3
DAY 4	**Quiz 6-1**	None
DAY 5	Negative Exponents	HW #4
DAY 6	Review of All Rules (Maze Activity)	HW #5
DAY 7	Scientific Notation	HW #6
DAY 8	**Quiz 6-2**	None
DAY 9	Graphing Exponential Functions	HW #7
DAY 10	Exponential Growth & Decay Applications	HW #8
DAY 11	Geometric Sequences	HW #9
DAY 12	**Quiz 6-3**	None
DAY 13	Simplifying Radicals: Square and Cube Roots	HW #10
DAY 14	Monomial Square Roots	HW #11
DAY 15	Unit 6 Review	Study for Test
DAY 16	**UNIT 6 TEST**	None

See sample images of the pages on the next page.

Name: Date:

Topic:

Main Ideas/Questions	Notes/Examples
MONOMIALS	• A monomial is a _____ • Examples: _____ • Monomials with
ADDING & SUBTRACTING MONOMIALS	• To add or subt • DO NOT CHAN Directions: Add or 1. $17x - 25x$ 3. $-15a^3bc + 6a^3bc$

Name: Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
Powers of Monomials	To raise a monomial to a power, use the POWER RULE:
Examples	Directions: Simplify. 1. $(x^2)^5$ 2. $(m^7n^4)^4$ 3 ➢ Examples wi

Name: Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
DIVIDING MONOMIALS	To divide monomials, use the QUOTIENT RULE: $\frac{x^a}{x^b} =$
EXAMPLES	Directions: Find each quotient. 1. $\frac{x^5}{x^3}$ 2. $\frac{k^{12}}{k^2}$ 3. $\frac{m^3}{m^3}$ 4. $\frac{a^6b^4}{}$ 5. $\frac{p^7q^{16}}{}$ 6. $\frac{x^{20}y^9z^2}{}$

Name: Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
Negative Exponents	Negative exponents can be rewritten using positive exponents using the NEGATIVE EXPONENT RULE: $x^{-a} =$

Name: Date:

Topic: Class:

Main Ideas/Questions	Notes/Examples
EXPONENTIAL Functions	• Exponential functions are defined by an equation of the form _____. • If $b > 1$, the function is an _____ _____ and is _____. • If $b < 1$, the function is an _____ _____ and is _____.
ASYMPTOTE	

Directions: Classify as an exponential growth or decay, create a table of values and graph, then identify its key characteristics.

1. $y = 2^x$

y

Growth / Decay

Exponent Rules Ma

Directions: Simplify the following monomials using the exponent rul to navigate through the maze. SHOW ALL WORK on a separat

$7x^{-3} \cdot 4x^{-2}$ | $28x^6$ | $\frac{9x^{14}}{18x^{-2}}$ | $\frac{1}{2x^7}$ | $(-4x^{-2})(9x^9$

$\frac{28}{x^5}$ | $-2x^{12}$ | $\frac{x^{12}}{2}$ | Start | $\frac{x^3}{4}$ | $\frac{-27}{x^{16}}$

EXPONENT RULES

Graphic On

Name	Rule	Examples
ADDING & SUBTRACTING MONOMIALS	COMBINE LIKE TERMS!!! (DO NOT CHANGE common variables and exponents!)	1. $9x^2y - 10x^2y =$ 2. Subtract $6w$ from $8w$
PRODUCT RULE	$x^a \cdot x^b =$	1. $h^2 \cdot h^6 =$ 2. $(-2a^2b) \cdot (7a^3b) =$
POWER RULE	$(x^a)^b =$	1. $(x^2)^3 =$ 2. $(-2m^5)^2 \cdot m^3 =$
		1. $\frac{27x^5}{42x} =$

Name:

Topic:

Main Ideas/Questions	Notes/Examples
Exponential Growth	Occurs when a quan Formula:
Examples	1. The original value of an inve each year. Use an exponen investment after 25 years. 2. The cost of tuition at a colleg each year. Use an exponen 3. The number of student athle at a rate of 8% per year. U student athletes after 5 yea 4. Annual sales for a company per year. Use an exponentia 5. The population of a small to year. Use an exponential fu years. 6. In 1985, there were 285 cell subscribers increased by 75 subscribers in 2008.

Name: _____ Unit 6: Exponents & Exp

Date: _____ Bell: _____ Homework 11: Monomi

Simplify the following radicals. SHOW ALL WORK!

1. $\sqrt{k^2}$	2. $\sqrt{m^3}$
3. $\sqrt{4a^2}$	4. $\sqrt{25x^6}$
5. $\sqrt{32x^3}$	6. $\sqrt{300y^4}$
7. $\sqrt{84w}$	8. $\sqrt{128c^5}$
9. $\sqrt{24a^3b^4}$	10. $\sqrt{81u^2v}$
11. $\sqrt{75p^5q^2}$	12. $\sqrt{100x^2y}$
13. $\sqrt{40m^4n^3}$	14. $\sqrt{96c^4d^2}$
15. $\sqrt{27ab^3}$	16. $\sqrt{56m^2n^4p^3}$
17. $\sqrt{150a^3b^2c}$	18. $\sqrt{45x^2y^9z^8}$
19. $\sqrt{72a^6b^2c^2}$	20. $\sqrt{98x^4y^6z^2}$

Unit 6 Test Study Guide

(Exponents & Exponential Functions)

Name: _____

Date: _____ Per: _____

Topic 1: Exponent Rules

PRODUCT RULE	POWER RULE	QUOTIENT RULE	NEGATIVE EXPONENT RULE
$x^a \cdot x^b =$	$(x^a)^b =$	$\frac{x^a}{x^b} =$	$x^{-a} =$

WHAT ABOUT ADDING AND SUBTRACTING MONOMIALS?

Topic 2: Simplifying Monomials

Simplify each expression completely. Final answer should contain only positive exponents.

1. $6ab - 8ab$	2. $-2xy^2 - 4xy + 6xy^2$	3. Subtract $-6b^5$ from $8b^5$.
4. $-7n^{-4} \cdot 5n^{-2}$	5. $(5v^4)^2 \cdot 2v^3 \cdot v$	6. $(-a^6b)^2 + 9a^{12}b^2$
7. $(-2y^4) \cdot (xy^3)^2 - 13x^2y^{10}$	8. $\frac{r^6s^7t^2}{r^5s^4t^2}$	9. $\frac{(-3x^6)^2}{5x^3 \cdot 3x^3}$
10. $\left(\frac{4x^4y^2}{6xy}\right)^2$	11. $\frac{7k^{-6} \cdot 3k^{-2}}{6k^2}$	12. $\frac{-9n^8}{27n^{10}}$
13. $\frac{a^{12}b^{-3}}{(ab)^{-3}}$	14. $\frac{3}{4}m^7n^6 \cdot m^5n^9 - \left(\frac{1}{2}m^9n^5\right)^3$	15. $(-4y^2)^2 \cdot (xy^4)^3 + 7x^3y^{18}$

Name: _____

Date: _____ Per: _____

Algebra I Unit 6 Test

Exponents & Exponential Functions

1. Simplify: $-7a^2b - 2a^2b$
   A. -9
   B. $-9a^2b$
   C. $-5a^2b$
   D. -5

2. Simplify: $2xy + 10x^2 - 9xy$
   A. $10x^2 - 7$
   B. $10x^2 + 11x^2y^2$
   C. $10x^2 + 11xy$
   D. $10x^2 - 7xy$

3. Simplify: $p^2 \cdot p^6$
   A. p^8
   B. $2p^8$
   C. p^{12}
   D. $2p^{12}$

4. Simplify: $(xy^3) \cdot (xy)^4$
   A. x^5y^7
   B. x^4y^{12}
   C. x^5y^7
   D. x^5y^{12}

5. Simplify: $(3x^2y^2)^3$
   A. $3x^5y^5$
   B. $9x^5y^5$
   C. $9x^6y^6$
   D. $27x^6y^6$

6. Simplify: $(-4c^3d)^2$
   A. $8c^6d^2$
   B. $16c^6d^2$
   C. $-16c^6d^2$
   D. $-8c^6d^2$

7. Simplify: $(5ab) \cdot (-2a^2b)^3$
   A. $-30a^6b^4$
   B. $-30a^7b^4$
   C. $-40a^6b^4$
   D. $-40a^7b^4$

8. Simplify: $(3x^{-2}y) \cdot (6xy^{-3})$
   A. $\frac{18}{xy^2}$ C. $\frac{9}{xy^2}$
   B. $\frac{18x}{y^2}$ D. $9xy^2$

9. Simplify: $(-a^2b^3)^2 \cdot (4a^3b^2) + 9a^7b^8$
   A. $5a^7b^8$
   B. $5a^{14}b^{16}$
   C. $13a^7b^8$
   D. $13a^{14}b^{16}$

10. Simplify: $\frac{3x^5y}{12x^3y^2}$
    A. $4x^2y$ C. $\frac{x^2y}{4}$
    B. $\frac{4}{x^2y}$ D. $\frac{x^2}{4y}$