Teachers: Castello, Pereira, Piuser, Tober

Course: Algebra 1

Periods: all

Assignment: Week 3 – Exponent Properties

Teacher: **Castello, Pereira, Piuser,Tober** Subject: **Algebra 1** Dates: **Week 3: 5/4-5/8**

Welcome to our Distance Learning Classroom!

Student Time Expectation per day: 30 minutes

Content Area & Materials Algebra 1	**Learning Objectives**	**Tasks** • Paper Packet Option • Digital Option	**Check-in Opportunities**	**Submission of Work for Grades** • Method: Scan, photo, email, or deliver
PAPER PACKET • Weekly Planner (this sheet) • 3 worksheets on simplifying exponential expressions. A key is attached for last 2 pages. Digital Option • Log on to your khan academy account at www.khanacademy.org • Complete the khan academy activities assigned by your teacher.	ESSENTIAL QUESTION: How do you use the exponent properties to simplify an exponential expression? STUDENTS WILL… • Be able to apply the appropriate property to simplify an exponential expression.	PAPER PACKET: If you picked up a paper packet you are expected to turn in the 3 completed pages in order to get credit for week 3. (per distance learning Calendar, week 3 work is due May 15). **All work must be shown to receive credit.** You are also welcome to scan or take photos of your work and email them to your teacher. ONLINE WORK: You are to complete the assigned Khan academy activities by May 15.	OFFICE HOURS: Mrs. Castello: Office Hours: Mon – Fri, 9am - 11am Email: ecastello@tusd.net Google #: (209) 597-8667 Ms. Pereira: Office Hours: Zoom meeting Mon-Fri, 12pm – 1pm Email: mpereira@tusd.net Google #: (209) 597-8039 Mr. Piuser: Office Hours: Mon-Fri, 12pm – 2pm Email: apiuser@tusd.net Google #: (209) 691-3102 Mrs. Tober: Office Hours: Mon – Fri, 1pm – 3pm Email: jtober@tusd.net Google #: (209) 597-8704	Students are expected to complete either the paper packet or the digital option in order to receive full credit. Students must include the work required to arrive at the correct answer. IF SUBMITTING THE PAPER PACKET, LABEL WITH: • Student Name (First and Last) • Teacher Name • Algebra 1 • Period #:____ PREFERRED: TO SUBMIT ELECTRONICALLY, simply email your teacher a scan or photos of your completed work.

Exponent Rules Review Worksheet

NOTE: Anything to the zero power equals 1!

Product Rule: When multiplying monomials that have the same base, add the exponents.

$$x^m \cdot x^n = x^{m+n}$$

Example 1: $x \cdot x^3 \cdot x^4 = x^{1+3+4} = x^8$ Example 2: $\left(2x^2y\right)\left(-3x^3y^4\right) = 2 \cdot (-3) \cdot x^2 \cdot x^3 \cdot y \cdot y^4 = -6x^5y^5$

Power Rule: When raising monomials to powers, multiply the exponents.

$$\left(x^m\right)^n = x^{m \cdot n}$$

Example 3: $(x^2y^3)^4 = x^{2 \bullet 4}\, y^{3 \bullet 4} = x^8y^{12}$ Example 4: $(2x^3yz^2)^3 = 2^3\, x^{3 \bullet 3}\, y^3\, z^{2 \bullet 3} = 8x^9y^3z^6$

Quotient Rule: When dividing monomials that have the same base, subtract the exponents.

$$\frac{x^m}{x^n} = x^{m-n}$$

Example 5: $\frac{x^3}{x^{-2}} = x^{3-(-2)} = x^5$ Example 6: $\frac{5^6}{5^2} = 5^{6-2} = 5^4$ Example 7: $\frac{36m^3n^5}{-9mn^4} = \frac{36}{-9} \cdot \frac{m^3}{m} \cdot \frac{n^5}{n^4} = -4m^2n$

Simplify each of the following. Copy the problem. Work on your own paper.

1) $a \cdot a^2 \cdot a^3$ 2) $(2a^2b)(4ab^2)$ 3) $(6x^2)(-3x^5)$ 4) $b^3 \cdot b^4 \cdot b^7 \cdot b$ 5) $(3x^3)(3x^4)(-3x^2)$

6) $(2x^2y^3)^2$ 7) $(5x^2y^4)^3$ 8) $(6x^4y^6)^3$ 9) $(4x^3y^3)^3$ 10) $(7xy)^2$

11) $\frac{x^3}{x}$ 12) $\frac{18c^3}{-3c^2}$ 13) $\frac{9a^3b^5}{-3ab^2}$ 14) $\frac{-48c^2d^4}{-8cd}$ 15) $\frac{22y^6z^8}{2yz^{-7}}$

16) $x^2 \cdot x^7$ 17) $\left(x^2\right)^7$ 18) $\left(-2x^4\right)^5$ 19) $2x^3 + 7x^3$ 20) 7^0

21) $8x^0$ 22) -3^4 23) $(-3)^4$ 24) $6x^0y^8 - \left(2y^2\right)^4$ 25) $(x+2y)(x-2y)$

26) $\frac{2x^3}{-8x^4}$ 27) $\frac{xy^7}{x^3y^4}$ 28) $6x^5 \cdot 3x^5 \cdot x^0$ 29) $\left(3st^{12}\right)^3$ 30) $\left(\frac{3m^2n^7}{m}\right)^5$

 Name_____

Properties of Exponents

Date_____ Period____

Simplify. Your answer should contain only positive exponents.

1) $2m^2 \cdot 2m^3$

2) $m^4 \cdot 2m^{-3}$

3) $4r^{-3} \cdot 2r^2$

4) $4n^4 \cdot 2n^{-3}$

5) $2k^4 \cdot 4k$

6) $2x^3y^{-3} \cdot 2x^{-1}y^3$

7) $2y^2 \cdot 3x$

8) $4v^3 \cdot vu^2$

9) $4a^3b^2 \cdot 3a^{-4}b^{-3}$

10) $x^2y^{-4} \cdot x^3y^2$

11) $(x^2)^0$

12) $(2x^2)^{-4}$

13) $(4r^0)^4$

14) $(4a^3)^2$

15) $(3k^4)^4$

16) $(4xy)^{-1}$

17) $(2b^4)^{-1}$

18) $(x^2y^{-1})^2$

19) $(2x^4y^{-3})^{-1}$

20) $(3m)^{-2}$

21) $\frac{r^2}{2r^3}$

22) $\frac{x^{-1}}{4x^4}$

23) $\frac{3n^4}{3n^3}$

24) $\frac{m^4}{2m^4}$

25) $\frac{3m^{-4}}{m^3}$

26) $\frac{2x^4y^{-4}z^{-3}}{3x^2y^{-3}z^4}$

27) $\frac{4x^0y^{-2}z^3}{4x}$

28) $\frac{2h^3j^{-3}k^4}{3jk}$

29) $\frac{4m^4n^3p^3}{3m^2n^2p^4}$

30) $\frac{3x^3y^{-1}z^{-1}}{x^{-4}y^0z^0}$

Kuta Software – Properties of Exponents Answer Key

1) $4m^5$

2) $2m$

3) $\frac{8}{r}$

4) $8n$

5) $8k^5$

6) $4x^2$

7) $6y^2x$

8) $4v^4u^2$

9) $\frac{12}{ab}$

10) $\frac{x^5}{y^2}$

11) 1

12) $\frac{1}{16x^8}$

13) 256

14) $16a^6$

15) $81k^{16}$

16) $\frac{1}{4xy}$

17) $\frac{1}{2b^4}$

18) $\frac{x^4}{y^2}$

19) $\frac{y^3}{2x^4}$

20) $\frac{1}{9m^2}$

21) $\frac{1}{2r}$

22) $\frac{1}{4x^5}$

23) n

24) $\frac{1}{2}$

25) $\frac{3}{m^7}$

26) $\frac{2x^2}{3yz^7}$

27) $\frac{z^3}{y^2x}$

28) $\frac{2h^3k^3}{3j^4}$

29) $\frac{4m^2n}{3p}$

30) $\frac{3x^7}{yz}$

Reminder: You must show your work required to arrive at these answers from the original problem. Simply writing the answers will not fulfill the requirements of this assignment. These are here only to help you make sure you are doing the problems correctly.