Name **Answer key**

Ms. Schmidt

Date _____

Intermediate Algebra

Unit 4 Review

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1) Write the following as POSITIVE exponents

a. 5^{-3} $\dfrac{1}{5^3}$

b. $\dfrac{x^{-1}}{9^{-5}}$ $\dfrac{9^5}{x}$

c. $\left(\dfrac{2}{3}\right)^{-2}$ $\dfrac{1}{\left(\frac{2}{3}\right)^2}$

2) Compute the value (evaluate by using calculator!)

a. $(-2)^4$ 16

b. $\left(\dfrac{4}{5}\right)^{-2}$ $\dfrac{25}{16}$

c. $\left(64^{\frac{2}{6}}\right)^3$ 64

d. $8^{\frac{2}{3}} \times 25^{\frac{3}{2}}$ 500

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3) Multiply. Exponents must be put into positive exponential form

a. $8^{-3} \cdot 8^7 = 8^4$

b. $4^4 \cdot 4^{13} \cdot 4 = 4^{18}$

c. $3x^6 \cdot -6x^{19} = -18x^{25}$

d. $3^{-5} \cdot 3^{-9} = \dfrac{1}{3^{14}}$

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4) Raising a Power to a Power: Multiply and put answers into positive exponential form.

a. $(5^4)^3 = 5^{12}$

b. $(3x^{-2}y)^4 = \dfrac{3^4 y^4}{x^8} \quad 3^4 x^{-8} y^4$

c. $(7^{-8})^2 \cdot 7^4 = \dfrac{1}{7^{12}} \quad 7^{-16} \cdot 7^4$

d. $(-2x^9)^2 = -2^2 x^{18}$

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5) Dividing exponents with the same base. Put answers in positive exponential form.

a. $\dfrac{6^{14}}{6^5} = 6^9$

b. $\dfrac{x^4}{x^7} = \dfrac{1}{x^3}$

c. $\dfrac{12y^{11}}{-8y^9} = -\dfrac{3}{2}y^2$

d. $\dfrac{9x^4 y^8 z}{3x^2 y^8 z^4} = \dfrac{3x^2}{z^3}$

e. $3^5 \div 3^3 = 3^2$

b. $8^7 \div 8^{13} = \dfrac{1}{8^6}$

c. $12x^{11} \div 4x^3 = 3x^8$

d. $\dfrac{(-2)^5}{(-2)^5} = 1$

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6) Rewrite the fractional exponents as a root.

a. $2^{\frac{4}{3}}$ $\sqrt[3]{2^4}$

b. $7^{\frac{1}{2}}$ $\sqrt[2]{7^1}$

c. $(4x^5)^{\frac{1}{3}}$ $\sqrt[3]{(4x^5)}$

d. $(5x)^{\frac{1}{2}}$ $\sqrt[2]{(5x)^1}$

7) Simplify each of the following with positive exponents.

a. $5x^0$

5

b. $(8x)^0$

1

c. $(5x^2y^{-2})^3$

$5^3x^6y^{-6}$

$\dfrac{5^3x^6}{y^6}$

d. $\dfrac{m^2}{m^{-3}}$

m^5

e. 9^{-8} $\dfrac{1}{9^8}$

f. $2x^6y^{-7}z^0$ $\dfrac{2x^6}{y^7}$

g. $(5x^{-5})(3x^2)$ $15x^{-3} \rightarrow \dfrac{15}{x^3}$

h. yx^{-2} $\dfrac{y}{x^2}$

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8) Solve and check for x.

a. $6^{2x+1} = 6^{3x-2}$

$2x+1 = 3x-2$

$\dfrac{-2x \quad\quad -2x}{1 = x - 2}$

$\dfrac{+2 \quad\quad +2}{3 = x}$

$6^{2(3)+1} = 6^{3(3)-2}$

$6^7 = 6^7$ ✓

b. $3^{2(x+1)} = 3^{3(x-1)}$

$2(x+1) = 3(x-1)$

$2x+2 = 3x-3$

$\dfrac{-2x \quad\quad -2x}{2 = x - 3}$

$\dfrac{+3 \quad\quad +3}{5 = x}$

$3^{2((5)+1)} = 3^{3((5)-1)}$

$3^{12} = 3^{12}$ ✓

c. $5^{3x-8} = 5^{4x}$

$3x - 8 = 4x$

$\dfrac{-6x \quad\quad -3x}{-8 = x}$

$5^{3(-8)-8} = 5^{4x}$

$5^{-32} = 5^{-32}$ ✓

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9) Perform each of the operations

a. Subtract $(-x^2 + 7x - 3)$ from $(2x^2 + 7x + 10)$

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

$2x^2 + 7x + 10 + x^2 - 7x + 3 = 3x^2 + 13$

b. Multiply: $(-2x + 3)(6x + 1)$

$-12x^2 - 2x + 18x + 3$

$-12x^2 + 16x + 3$

c. Add $(10x^3 + 8x^2 + 1)$ and $(-7x^3 + 3x^2 - 2x - 1)$

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

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10) Is (0, -3) a solution of the system of equations: $-5x + y = -3$

$3x - 8y = 24$

yes!

$-5(0) + (-3) = -3$

$-3 = -3$ ✓

$3(0) - 8(-3) = 24$

$24 = 24$

11) Solve the system of equations and check: $-8x + 2y = 0$

$x = 3y$

$(0,0)$

$-8(3y) + 2y = 0$
$-24y + 2y = 0$
$-22y = 0$
$y = 0$

$X = 3(0) = 0$

Check
$0 = 3(0)$
$0 = 0 \checkmark$
$-8(0) + 2(0) = 0$
$0 = 0 \checkmark$

12) Is $(3, -1)$ a solution of the system of equations: $-4x + y = -17$

$-5x - 7y = -13$

$-4(3) + (-1) = -17$
$-13 \neq -17$

NO!

13) Simplify each of the following with positive exponents.

a. $\dfrac{36x^2y}{12xy^3}$ $\dfrac{3X}{y^2}$

b. $\dfrac{-10x^5y^7}{5x^5y^7}$ -2

c. $(-3a^3 + 5a^2 + a - 13) - (4a^3 + 2a^2 + 6a - 2)$

$-7a^3 + 7a^2 - 5a - 11$

d. $5^{\frac{3}{4}}$ $\sqrt[4]{5^3}$

e. $-7x^{-2}$ $\dfrac{-7}{x^2}$

f. $7x^0y^{-3}$ $\dfrac{7}{y^3}$

g. $(3^2)^{-6}$ $3^{-12} = \dfrac{1}{3^{12}}$

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14) Find the sum of $4x^2 - 3x - 5$ and $2x^2 + 2x - 8$

add $\quad 6x^2 - x - 13$

15) Multiply: $(3x + 2)(x - 10)$

$$3x^2 - 30x + 2x - 20$$
$$3x^2 - 28x - 20$$

16) Simplify: $(x^2 - 5x - 2) - (-6x^2 + 7x + 3)$

$$7x^2 + 2x + 1$$

17) Subtract $3x^2 - 2x + 9$ from $2x^2 - 5x + 13$

$$(2x^2 - 5x + 13) + (-3x^2 + 2x - 9)$$
$$-x^2 - 3x + 4$$

18) Add $(6x^2 + 10x - 5)$ and $(8x^2 + 10x - 2)$

$$14x^2 + 20x - 7$$