Name_____ Date_____ Period_____

Worksheet 1.1—Exponents

No Calculator

I. Multiple Choice: Show all work on MC questions. No work, No credit.

_____ 1. Which of the following is equivalent to $x^{3/4}$?

$\quad$ (A) $\dfrac{1}{x^{4/3}}$ $\qquad$ (B) $x^{-4/3}$ $\qquad$ (C) $x^{4/3}$ $\qquad$ (D) $\sqrt[3]{x^4}$ $\qquad$ (E) $\sqrt[4]{x^3}$

_____ 2. What is the value of $\left(-\dfrac{1}{2}\right)^{-4}$?

$\qquad$ (A) 16 $\qquad$ (B) 2 $\qquad$ (C) 8 $\qquad$ (D) -8 $\qquad$ (E) -16

_____ 3. Which of the following is the simplified form of $\dfrac{x^6}{x^{-2}}, x \neq 0$?

$\qquad$ (A) x^{-4} $\qquad$ (B) x^2 $\qquad$ (C) x^3 $\qquad$ (D) x^4 $\qquad$ (E) x^8

_____ 4. Simplify $\left(-3x^2 y^5\right)^{-4}$ using only positive exponents.

$\quad$ (A) $81x^8 y^{20}$ $\qquad$ (B) $\dfrac{x^8 y^{20}}{81}$ $\qquad$ (C) $\dfrac{1}{81x^8 y^{20}}$ $\qquad$ (D) $\dfrac{-1}{81x^8 y^{20}}$ $\qquad$ (E) $\dfrac{81}{x^8 y^{20}}$

_____ 5. Evaluate $-625^{1/4}$

       (A) -5 (B) 5 (C) $-\dfrac{1}{5}$ (D) $\dfrac{1}{5}$ (E) DNE, "Does Not Exist"

_____ 6. Evaluate $\left(\dfrac{36}{25}\right)^{-3/2}$

       (A) $\dfrac{6}{5}$ (B) $\dfrac{125}{216}$ (C) $\dfrac{216}{125}$ (D) $\dfrac{5}{6}$ (E) $-\dfrac{216}{125}$

_____ 7. If $x=-2$ and $y=-3$, what is the value of the expression $\dfrac{c^x}{c^y}-\dfrac{c^y}{c^x}$, for $c\neq 0$.

       (A) 0 (B) $\dfrac{c^2+1}{c}$ (C) $2c$ (D) $\dfrac{c^2-1}{c}$ (E) $\dfrac{c}{1-c^2}$

_____ 8. The expression $\dfrac{3^{1/3}}{3^{-2/3}}$ is equivalent to which of the following?

       (A) 1 (B) 3 (C) $\sqrt{3}$ (D) $\dfrac{1}{\sqrt[3]{3}}$ (E) $\dfrac{1}{\sqrt{3}}$

II. Short answer

9. Find any and all mistakes, explain what they are, then work the problem correctly

   (a) $\left(-4ab^5\right)^7 = -28a^7b^{12}$

   (b) $\left(3x^2 y^{1/2}\right)\left(7x^{10} y^8\right) = -21x^{20} y^4$

10. Simplify each the expressions as much as possible (if possible). **For each term, you should have only one representative factor of each type**. Practice writing your final answer without any fractional or negative exponents.

   (a) $\dfrac{\left(x^{-3} y^2\right)^{-4}}{\left(\sqrt{y^6} x^{-4}\right)^{-2}}$

   (b) $\left(\dfrac{4a^3 b}{\sqrt[3]{a^2 b^3}}\right)\left(\dfrac{2a^2 b^4}{3b^2}\right)^{-1}$

   (c) $2x^4 y^{-3} x^{-19} + y^{\frac{1}{3}} y^{-\frac{3}{4}}$

   (d) $\dfrac{x^{\frac{3}{5}} x^2 x^{-\frac{1}{2}}}{x^{\frac{1}{10}}}$

   (e) $\left(\dfrac{2x^{-2} x^{\frac{4}{5}} y^6}{x+y}\right)^{-3}$

   (f) $\dfrac{x^2 y^{-3} \cdot \sqrt{9\sqrt{x^{-3}\sqrt{y^5}}}}{\sqrt{x^3 y^5}}$

11. Provide a counterexample for the claim that $\sqrt{a^2 + b^2} = a + b$. Clearly define you values and show your work.