

Name: \_\_\_\_\_

Date: \_\_\_\_\_

## Homework: Laws of Exponents

Simplify each expression using only positive exponents.

1)  $\left(\frac{a^3}{a^4}\right)^{-\frac{1}{3}}$

2)  $\left(\frac{1}{16}w^{50}x^{-24}y^0\right)^{\frac{1}{2}} \left(\frac{1}{2}xy^4\right)^{-2}$

3)  $\left(\frac{-30a^{19}b^{-15}c^{20}}{72b^{-1}c^{10}}\right)^{-3}$

4) Explain what a rational exponent, such as  $\frac{5}{2}$  means. Use this explanation to evaluate  $(9)^{5/2}$ .

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5) Write  $\sqrt[3]{x} \cdot \sqrt{x}$  as a single term with a rational exponent.

6)

For  $x \geq 0$ , which equation is *false*?

(1)  $\left(x^{\frac{3}{2}}\right)^2 = \sqrt[4]{x^3}$

(3)  $\left(x^{\frac{3}{2}}\right)^{\frac{1}{2}} = \sqrt[4]{x^3}$

(2)  $(x^3)^{\frac{1}{4}} = \sqrt[4]{x^3}$

(4)  $\left(x^{\frac{2}{3}}\right)^2 = \sqrt[3]{x^4}$

Write each in simplest radical form. Then completely simplify, without a calculator.

7)  $343^{\frac{1}{3}}$

8)  $10000^{\frac{1}{4}}$

9)  $(\frac{49}{36})^{\frac{3}{2}}$

10)  $(-\frac{125}{729})^{-\frac{4}{3}}$

11) Write the following expression in standard form:

$$(2x + c)^2 - 3(x - c) + 9$$

12) Which statement is *not* always true?

- (1) The product an irrational number and a nonzero rational number is irrational.
- (2) The product of two rational numbers is rational.
- (3) The product of two integers is a whole number.
- (4) The product of two real numbers is a real number.

13) Explain how  $(8)^{3/4}$  can be evaluated using properties of rational exponents. Then determine if  $(8)^{3/4}$  is rational or irrational. Explain your reasoning.

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