Rational Exponents REVIEW
(NO CALCULATOR!)

Name Key

Students will ...Extend the properties of exponents to rational exponents. ____ **/ 30 points**

True or False. Write the entire word. (1 point each)

F 1. $3^{-2} = -9$ T 2. $2^4 \cdot 2^5 = 2^9$ T 3. $\frac{2}{x^{-3}} = 2x^3$

F 4. $\left(\frac{4}{a}\right)^{-1} = -4a$ F 5. $\left(a^9\right)^3 = a^{12}$ F 6. $\frac{x^2}{x^{-2}} = 1$

Rewrite using rational exponent notation. (1 point each)

7. $\sqrt[2]{x^3} = x^{3/2}$

8. $\sqrt[5]{2x^2y^4} = 2^{1/5}x^{2/5}y^{4/5}$

Rewrite the expression using simplified radical notation. (1 point each)

9. $x^{\frac{3}{5}}$ $\sqrt[5]{x^3}$

10. $a^{\frac{1}{3}}b^{\frac{1}{2}}$ $\sqrt[6]{a^2b^3}$

Evaluate each expression. (2 points each)

11. $27^{2/3}$ $\left((3)^3\right)^{2/3} = 3^2 = 9$

12. $\left(\frac{25}{64}\right)^{1/2} = \frac{5}{8}$

13. $64^{-1/3}$ $\frac{1}{\sqrt[3]{64}} = \frac{1}{4}$

14. $7^{\frac{1}{4}} \cdot 7^{\frac{7}{4}} = 7^{8/4} = 7^2 = 49$

Simplify each expression. Write each answer in the form of the original expression. (2 points each)

15. $\sqrt[4]{32x^5y^3}$ $2x\sqrt[4]{2xy^3}$

16. $\sqrt[6]{m^3} = m^{1/2} = \sqrt{m}$

17. $\left(x^3\right)^{5/12} = x^{15/12} = x^{5/4}$

18. $\sqrt[3]{x} \cdot \sqrt[6]{x}$ $\sqrt[6]{x^3} = x^{1/2} = \sqrt{x}$

19. $\left(\frac{x^{-6}y^9}{27}\right)^{-1/3}$ $\frac{x^2y^{-3}}{27^{-1/3}} = \frac{3x^2}{y^3}$

20. $\frac{y^{4/4}}{y^{\frac{3}{4}}}$ $y^{1/4}$