

Exploration of Rational Exponents

Name _____

Using your calculator, complete the following table.

Expression	Numerical Value	Expression	Numerical Value
$(4)^{\frac{1}{2}} = ?$		$\sqrt[2]{4^1} = \sqrt{4} = ?$	
$(64)^{\frac{1}{3}} = ?$		$\sqrt[3]{64^1} = ?$	
$(8)^{\frac{2}{3}} = ?$		$\sqrt[3]{8^2} = ?$	
$(16)^{\frac{1}{4}} = ?$		$\sqrt[4]{16^1} = ?$	
$(25)^{-\frac{1}{2}} = ?$		$(\sqrt[2]{25})^{-1} = \frac{1}{\sqrt{25}} = ?$	
$(2^3)^{\frac{1}{2}} = ?$		$\sqrt[2]{(2)^3} = ?$	

1. What did you notice about your answers to the problems in the same rows?
2. Is there some pattern that relates the two expressions in each row to one another? Describe the pattern.
3. Given the expression $(5^3)^{\frac{1}{4}}$, what expression using a root symbol would yield the same numerical value?
4. Given the expression $\sqrt[3]{54}$, what expression utilizing a fractional exponent would yield the same numerical value?

Name _____ Date _____ Per _____

Radicals and Rational Exponents HW (graded on completion)

Rewrite the expression using rational exponent notation.

1. $\sqrt[3]{7}$

2. $(\sqrt[3]{6})^2$

3. $(\sqrt[5]{14})^4$

4. $(\sqrt[7]{-21})^3$

5. $(\sqrt[8]{11})^7$

6. $(\sqrt[9]{-2})^4$

Rewrite the expression using radical notation.

7. $17^{1/3}$

8. $44^{1/6}$

9. $33^{2/3}$

10. $9^{5/3}$

11. $(-28)^{7/5}$

12. $39^{4/7}$

Evaluate the expression without using a calculator.

13. $(\sqrt[3]{8})^2$

14. $(\sqrt[4]{16})^3$

15. $(\sqrt[4]{81})^4$

16. $36^{3/2}$

17. $4^{5/2}$

18. $27^{2/3}$

19. $125^{4/3}$

20. $(-8)^{1/3}$

21. $(-32)^{3/5}$