Fill in the tables below WITHOUT using a calculator.

Given	Rewrite	Multiply	Simplify
1. $100^{1/2}$	$(10^2)^{1/2}$	$10^{2 \cdot 1/2}$	10
2. $27^{1/3}$	$(3^3)^{1/3}$	$3^{3 \cdot 1/3}$	3
3. $16^{1/4}$	$(2^4)^{1/4}$	$2^{4 \cdot 1/4}$	2
4. $25^{3/2}$	$(5^2)^{3/2}$	$5^{2 \cdot 3/2}$	$5^3 \to 125$
5. $64^{3/2}$	$(8^2)^{3/2}$	$8^{2 \cdot 3/2}$	$8^3 \to 512$
6. $64^{2/3}$	$(4^3)^{2/3}$	$4^{3 \cdot 4/3}$	$4^2 \to 16$
7. $9^{-1/2}$	$(3^2)^{-1/2}$	$3^{2(-1/2)}$	$3^{-1} \to 1/3$
8. $1000^{-2/3}$	$(10^3)^{-2/3}$	$10^{3(-2/3)}$	$10^{-2} \to 1/100$
9. $8^{-4/3}$	$(2^3)^{-4/3}$	$2^{3(-4/3)}$	$2^{-4} \to 1/16$

Given	Convert to Exponent	Rewrite	Multiply	Simplify
1. $\sqrt[3]{8}$	$(8)^{1/3}$	$(2^3)^{1/3}$	$2^{3 \cdot (1/3)}$	2
2. $\sqrt[3]{27}$	$(27)^{1/3}$	$(3^3)^{1/3}$	$3^{3 \cdot 1/3}$	3
3. $\sqrt[4]{81}$	$(81)^{1/4}$	$(3^4)^{1/4}$	$3^{4 \cdot 1/4}$	3
4. $\sqrt{4^3}$	$(4)^{3/2}$	$(2^2)^{3/2}$	$2^{2 \cdot 3/2}$	$2^3 \to 8$
5. $\sqrt{4^2}$	$(4)^{2/2}$	$(2^2)^1$	2^2	4
6. $\sqrt[3]{4^3}$	$(4)^{3/3}$	$(2^2)^1$	2^2	4
7. $\sqrt[4]{64^3}$	$(64)^{3/4}$	(	Bad Problem	
8. $\sqrt[2]{64^3}$	$(64)^{3/2}$	$(8)^{3/2}$	$8^{2 \cdot 3/2}$	$8^3 \to 512$
9. $\sqrt[4]{10000^{-1}}$	$(10000)^{-1/4}$	$(10^4)^{-1/4}$	$10^{4(-1/4)}$	10^{-1} $1/10$

Math II   Evaluating Fractional Exponents

When is it appropriate to use technology to evaluate a radical or fractional exponent? Give a specific example of both.

When the exponent is NOT a whole #, you must use a calc.

$5^3 \rightarrow 125$ $5^{1/3} \rightarrow \approx 1.710$

calc NOT needed   calc IS needed

Use Technology to evaluate the following. Round all decimals to the nearest thousandth **(three decimals places)**

Given	Estimate to three decimals.
$25^{1/3}$	$(5^2)^{1/3} \rightarrow 5^{2/3} \rightarrow \approx 8.450$
$16^{2/5}$	$(2^4)^{2/5} \rightarrow 2^{8/5} \rightarrow \approx 3.031$
$\sqrt{10}$	$(10)^{1/2} \rightarrow 10^{1/2} \rightarrow \approx 3.162$
$\sqrt[3]{49}$	$(7^2)^{\frac{1}{3}} \rightarrow 7^{2/3} \rightarrow \approx 3.659$
$3^{-1/2}$	$(3)^{-1/2} \rightarrow \frac{1}{3^{1/2}} \rightarrow \approx 0.577$

As discussed in class, the **definition of a square root** answers the question "what number multiplied by itself gives me the radicand?" That said explain why these two square roots have vastly different answers.

$$\sqrt{36} \text{ and } \sqrt{-36}$$

$6 \cdot 6 = 36$
therefore $\sqrt{36} = 6$

$6 \cdot 6 = 36$ therefore $\sqrt{-36}$ is not possible.
$(-6)(-6) = 36$