Final Review

Units 1 & 2

I. Rational Numbers

A number is rational if:

- it is the _____ _____ of a _____ _____ or _____ _____ of a _____ _____.
- it is a decimal that either _____ or _____.
- it is a _____ or _____ _____.
- it is an _____.

*** Examples: Rational or Irrational?**

$1\frac{2}{5}$

-13

$17.198213513\ldots$

$\sqrt[3]{49}$

$13.\bar{1}$

II. Decimal to Fractions

- Terminating decimals:
  - _____ it like you _____ it, then _____.

- Repeating decimals:
  - Go through the " _____" process.

*** Examples: Write each as a fraction.**

$.15$ $.\overline{15}$

III. Simplify Square & Cube Roots

- Make a _____ _____, then:
  - for square roots, _____ come out, non-pairs stay in.
  - for cube roots, groups of _____ come out, all other factors stay in.

*** Examples: Simplify completely.**

$\sqrt{32} =$ ____ $\sqrt[3]{32} =$ ____

IV: Properties of Exponents

- When _____ the same base, _____ the exponents.
- When _____ the same base, _____ the exponents.
- Don't leave any negative exponents as part of your final answer.

*** Examples. Simplify completely.**

$x^{10} \cdot x^{2} =$ $\qquad$ $\frac{x^{-10}}{x^{2}} =$

V: Scientific Notation

- Move the decimal point to make a number from _____.
- Count the number of places the decimal point moved.
  - If the original number was _____ _____ ___, there will be a _____ exponent.
  - If the original number was _____ _____ ___, there will be a _____ exponent.

*** Examples. Write in scientific notation.**

$2{,}310{,}000 =$ _____ $\qquad$ $0.00003 =$ _____

VI: Operations with Numbers in Scientific Notation.

- Perform the _____ _____ (+, -, x, /) with the _____.
- When _____ or _____, the exponent stays the _____.
- When _____ or _____,, use the correct _____ _____ _____.
- Write the final answer in scientific notation.

***Examples. Perform the indicate operation; express your answer in scientific notation.**

$(2.1\times10^{-5})(8.9\times10^{-5})$ $\qquad$ $(2.1\times10^{-5})+(8.9\times10^{-5})$

Directions: Identify the following numbers as either **Rational or Irrational numbers.** Write the entire word **Rational or Irrational** on the line provided.

1. _____ $.\overline{3}$

2. _____ $\sqrt{100}$

3. _____ $\sqrt[3]{64}$

4. _____ $16\frac{2}{3}$

5. _____ 11.1267…

6. _____ $\sqrt[3]{100}$

Directions: Convert the following fractions to decimals and decimals to fractions. All answers must be completely simplified. Show all work to receive full credit.

7. $0.14 =$ _____

8. $0.\overline{14} =$ _____

9. $0.\overline{4} =$ _____

Directions: Simplify the following radical expressions.

10. $\sqrt{75} =$ _____

11. $\sqrt[3]{128} =$ _____

12. $\sqrt{128} =$ _____

13. $\sqrt[3]{56} =$ _____

Directions: Simplify completely.

14. $\left(\frac{1}{5}\right)^{-2}$ =____

15. $p^{-8} \cdot p^{-5}$ =_____

16. $\frac{p^{-8}}{p^{-5}}$ = _____

17. $\frac{x^2 y^{-5} z}{x^2 yz}$ =_____

18. $m^8 \cdot m^{-8}$ =_____

19. $xy^2 \cdot x^2 y^4$ = _____

Directions: Write in scientific notation.

20. 0.0000521= _____

21. 296,000,000= _____

Directions: Perform the indicate operation. Express your final answer in scientific notation.

22. $(5.7 \times 10^5) + (1.14 \times 10^5)$ = _____

23. $(5.7 \times 10^5) - (1.14 \times 10^5)$ = _____

24. $(5.7 \times 10^5)(1.14 \times 10^5)$ = _____

25. $(5.7 \times 10^5) \div (1.14 \times 10^5)$ = _____