Unit 1: Extending the Number System
PRE-TEST

For each of the following answer:
a) Tell what subset best describes the given number.
b) What other subsets of the number system does the number fall into?

1. -5
   a.

   b.

2. e
   a.

   b.

3. 0
   a.

   b.

4. 3.121212…
   a.

   b.

5. When you add a rational number to an irrational number, what would the result be? Explain.

6. When you add a rational number to a rational number, what would the result be? Explain.

Using the properties of exponents, simplify each of the following expressions.

7. $(3a^3b^5)^{-3}$

8. $\dfrac{4r^4s^5}{24r^4s^{-5}}$

9. $(8x^{3/5}y^{6/5})^{1/3}$

10. $\left(\dfrac{192s^{8/3}t^{-5/2}}{3s^{-4/3}t^{3/2}}\right)^{-1/4}$

Error Analysis:
   a) Describe the error that has occurred in the given expression.
   b) What would the correct answer be?

11. $(-3)^2(-3)^4 = 9^6$

Write an expression that will make the statement true.

12. $(a^5b^4)^2 = a^{14}b^{-1} \cdot \; ?$

Rewrite each of the radical notations in exponent notation.

13. $\left(\sqrt[4]{5}\right)^5$

14. $\left(\sqrt[3]{5^8}\right)$

Rewrite each of the exponent notations in radical notation.

15. $14^{2/5}$

16. $21^{9/4}$

17. A family is a food vendor at the local fair and sells their corndogs for $4 each.
      a. If it costs the family $300 to set up at the fair, write an equation that will model the families profit, p, if they sell n corndogs.

      b. How many corndogs will the family have to sell in order to start making a profit?

18. The population of staphylococcus aureaus doubles in size every 30 minutes without treatment. If the population was 235 micrometers when the doctor first checked the patient:
      a. Write an equation that would model the population in micrometers after t hours.

      b. How many micrometers are there after 10 hours without treatment?

19. The height of an object thrown or dropped can be found by plugging into the equation
$$h(t) = -16t^2 + v_o t + h_o$$
      a. Write the equation that would model the height of a ball dropped from the roof of a thirty foot tall building.

      b. How long will it take for the ball to hit the ground?