Pre-Algebra

Homework 8: Powers, Exponents, Square Roots

1. **Simplify the following expressions leaving no negative exponents:**

$$a^4b^2a/a^5 \tag{1}$$

$$(-6y^3)^2 \tag{2}$$

$$\frac{(3x^2)^3}{9(x^3y)^2} \tag{3}$$

$$(4xy)^3(z^2)^{-3} \tag{4}$$

$$6^3/(2^39) \tag{5}$$

$$12^34^{-3}/81 \tag{6}$$

2. **Write in scientific notation (use 2 decimal places):**

$$0.0001 \tag{7}$$

$$(5 \times 10^{-12})(2.5 \times 10^9) \tag{8}$$

$$457234516 \tag{9}$$

$$(7 \times 10^4)(5 \times 10^{-7}) \tag{10}$$

3. If in the world there are approximately 6.7 billion people, and each person drinks approximately 1 liter of water every day. Write in scientific notation the amount of water that the entire world population drinks every year.

4. There are approximately 100 billion stars in the galaxy. If each star has the same mass as the Sun, 2×10^{33} gm, what is the mass of the Galaxy in grams?

5. President Obama sets up a stimulus fund of 1 trillion dollars to pay for the repair, construction and purchase of houses. If an average of $100,000 is spent on each house, how many houses will this buy? Is it enough to house all 300 million people living in the USA? (make an assumption about the average size of a family). If not, roughly what percentage of the population can be housed with this money?

6. What are the square roots of: 100, 169, 0.01, 81, 0.25?