Pre-Algebra Worksheet 8: Powers, Exponents and Square Roots

- **Simplify the following expressions leaving no negative exponents:**

$$2a^5b^3a/b^5 \tag{1}$$

$$\frac{3x^{-2}}{6xy^3} \tag{2}$$

$$(-8x^3)^2 \tag{3}$$

$$\frac{(2y^3)^2}{4(y^2x)^3} \tag{4}$$

$$\left(\frac{3n^{-4}}{m^7}\right)^3 \tag{5}$$

$$(5xy)^3(z^{-2})^{-3} \tag{6}$$

$$12^3/(2^69) \tag{7}$$

$$15^33^{-3}/25 \tag{8}$$

- **Write in scientific notation:**

$$0.0031 \tag{9}$$

$$314 \times 100,000,000 \tag{10}$$

$$(5 \times 10^{11})(2.9 \times 10^{-3}) \tag{11}$$

- **Word problems:**

1. If somebody buys an apple pie and every day eats half of what remains of the pie, what fraction of the pie is the person going to have after one week? (Express your answer as an exponential expression).

2. A certain population of bugs would increase by a factor of four every year in the absence of predators. Assuming that there are no predators, after how many year would the number of bugs increase by a factor 64?
3. A person buys a square piece of land with a surface of 64 m^2, how many meters of fence does the person need to buy in order to enclose the land?
4. The human body is composed of approximately 60% water. If the mass of a molecule of water is approximately 3×10^{-23} grams, how many molecules of water (approximately) does a person that weighs 100 kilograms have in her/his body?