Alg2 Homework, due Friday, Jan 12

Answers should be on a separate sheet of paper.

The following formulas for paper folding were discovered by Britney Gallivan in 2001 when she was a high school junior. The first formula determines the minimum width, W, of a square piece of paper of thickness T needed to fold it in half n times, alternating horizontal and vertical folds. The second formula determines the minimum length, L, of a long rectangular piece of paper of thickness T needed to fold it in half n times, always folding perpendicular to the long side.

$$W = \pi \cdot T \cdot 2^{\frac{3(n-1)}{2}} \qquad\qquad L = \frac{\pi T}{6}(2^n + 4)(2^n - 1)$$

1. Notebook paper is approximately 0.004 in. thick. Using the formula for the width W, determine how wide a square piece of notebook paper would need to be to successfully fold it in half 13 times, alternating horizontal and vertical folds.

2. Toilet paper is approximately 0.002 in. thick. Using the formula for the length L, how long would a continuous sheet of toilet paper have to be to fold it in half 12 times, folding perpendicular to the long edge each time?

3. Use the properties of exponents to rewrite each expression in the form ab^x.
Then evaluate the expression for the given value of x.

$$2x^3 \cdot \frac{5}{4}x^{-1}\,;\, x = 2$$

$$\frac{9}{(2x)^{-3}}\,;\, x = -\frac{1}{3}$$

Simplify These Three (3)

$$2x^5 \cdot x^{10}$$

Extra Credit (2)

$$\left(\frac{3}{x^{-22}}\right)^{-3}$$

$$\frac{1}{3x^8}$$

$$(x^2)^n \cdot x^3$$

$$\frac{6x^5}{x^{-3}}$$