CHALLENGE In Exercises 46−48, tell whether the statement is true for all nonzero values of a and b. If it is not true, give a counterexample.

46. $\dfrac{a^{-3}}{a^{-4}} = \dfrac{1}{a}$

47. $\dfrac{a^{-1}}{b^{-1}} = \dfrac{b}{a}$

48. $a^{-1} + b^{-1} = \dfrac{1}{a+b}$

49. **REASONING** For $n > 0$, what happens to the value of a^{-n} as n increases?

PROBLEM SOLVING

50. **MASS** The mass of a grain of salt is about 10^{-4} gram. About how many grains of salt are in a box containing 100 grams of salt?

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51. **MASS** The mass of a grain of a certain type of rice is about 10^{-2} gram. About how many grains of rice are in a box containing 10^3 grams of rice?

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52. **BOTANY** The average mass of the fruit of the wolffia angusta plant is about 10^{-4} gram. The largest pumpkin ever recorded had a mass of about 10^4 kilograms. About how many times greater is the mass of the largest pumpkin than the mass of the fruit of the wolffia angusta plant?

53. **MEDICINE** A doctor collected about 10^{-2} liter of blood from a patient to run some tests. The doctor determined that a drop of the patient's blood, or about 10^{-6} liter, contained about 10^7 red blood cells. How many red blood cells did the entire sample contain?

54. **TAKS REASONING** One of the smallest plant seeds comes from an orchid, and one of the largest plant seeds comes from a giant fan palm. A seed from an orchid has a mass of 10^{-9} gram and is 10^{13} times less massive than a seed from a giant fan palm. A student says that the seed from the giant fan palm has a mass of about 1 kilogram. Is the student correct? *Explain*.

Orchid   Giant fan palm

55. **MULTIPLE REPRESENTATIONS** Consider folding a piece of paper in half a number of times.

   a. **Making a Table** Each time the paper is folded, record the number of folds and the fraction of the original area in a table like the one shown.

Number of folds	0	1	2	3
Fraction of original area	?	?	?	?

   b. **Writing an Expression** Write an exponential expression for the fraction of the original area of the paper using a base of $\dfrac{1}{2}$.