APPLICATIONS & FORMULAS

RATES

A **rate** is a ratio between two measurements with different units. In addition to the three ways to write a ratio, rates may also use the word "per". Rates are usually simplified to a one in the denominator (second measurement).

<div align="center">

13 miles per gallon $4.59 per pound   12 inches per foot

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INTEREST

There are basically two kinds of **interest**: simple and compound. Simple interest is paid on the principal amount only. Compound interest is paid on the principal amount plus accrued interest. The formula to find simple interest is $I = prt$ where p is the principal, r is the interest rate, and t is the time period. The formula to find compound is $A = p(1 + r)^n$ where p is the principal, r is the interest rate, and n is the number of interest periods.

SALES TAX

Sales Tax is written in percentages (which are converted to decimal to computer sales tax). The final purchase price of an item = marked price + (sales tax times marked price). Using FP for final price, MP for marked price, and ST for sales tax, the algebraic equations is: **FP = MP + (ST × MP)** If you know two of those three amounts, you can use basic algebra to find the missing number. Remember to state the sales tax as a percentage in application problems.

DISCOUNTS

Discounts are usually written as percentages. A discount is an amount by which the purchase price is reduced. Be careful when working with discount problems because the answer may be the discount percentage, an amount of money discounted, the sales price after the discount, or the original sales price. **Discount amount** is the original sales price multiplied by the percentage of discount. The **discounted price** is the difference of the original price and the discount amount. The formula is: **OP – (OP * D) = DP**, *where OP is the original price, D is the discount percentage written as a decimal number, and DP is the discounted price.*

PERCENT CHANGE

The **percent of change** is also known as the percent of **increase** or the percent of **decrease**. To calculate the percent of change,

1. Find the difference between the new amount and the original amount
2. Divide that difference by the original amount
3. Multiply by 100

SALES COMMISSIONS

When we think of **sales commissions**, we often think of car sales. Thus, it is appropriate that the formula for commission is **C = ar**, where C = commission earned, a = amount of sale, and r = commission rate.

Example: Juana sells cars on a 3% commission rate. She just sold a car for $23,500. What was her commission?

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        C = ar
  C = 23500(.03)
      C = $705
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