APES MATH (no calculators)

Per Capita= divide by the total population
US Population currently about 300,000,000

Rate of Change: (old-new) / old

Percent Change: {(old-new) / old } x 100

Annual % Change:
$$\frac{(\text{births} + \text{immigrants}) - (\text{deaths} + \text{emigrants})}{\text{number of people}} \times 100$$

Doubling Time: 70 / % growth = years to double

Determining Percentage: $\frac{\text{part}}{\text{whole}} = \frac{\%}{100}$

Half Life Fractions:
1/2; 1/4; 1/8; 1/16; 1/32; 1/64; 1/128; 1/256

Primary Productivity:
Net Productivity = Gross Product. – Cell Respiration

Conversions:
1 Megawatt = 1,000 kilowatts
1 kilowatt = 1,000 watts
1 kilowatt hour = 10,000 BTU's
kilowatts x hours = kwh
1L = 1,000 mL

Scientific Notation:
**To S.N.
0.00068 → 6.8×10^{-4}
6,845 → 6.8×10^{3}
**To Standard
5.56×10^{-6} → 0.00000556
5.56×10^{6} → 5,560,000

Messing with Scientific Notation:
**Multiplication→ add exponents; multiply bases
$(3 \times 10^{3})(4 \times 10^{5}) = 12 \times 10^{8} = 1.2 \times 10^{9}$

** Division→ subtract exponents; divide bases
$(5.2 \times 10^{4}) / (2.6 \times 10^{2}) = 2 \times 10^{2}$

**Addition→ convert both #'s to the same exponent; add bases; exponents stay the same
$(3000 \times 10^{6}) + (14 \times 10^{5}) = 3001.4 \times 10^{6} = 3.0 \times 10^{9}$

**Subtraction→ convert both #'s to same exponent; subtract bases; exponents stay the same
$(2000 \times 10^{3}) - (1000 \times 10^{2}) = 1900 \times 10^{3} = 1.9 \times 10^{6}$

Population Density: $\frac{\text{total population}}{\text{total area}}$

Birth Rate (as a %): $\left(\frac{\text{total births}}{\text{total population}}\right) \times 100$

Birth Rate (per 1000): $\left(\frac{\text{total births}}{\text{total population}}\right) \div 1000$

Death Rate (as a %): $\left(\frac{\text{total deaths}}{\text{total population}}\right) \times 100$

Birth Rate (per 1000): $\left(\frac{\text{total deaths}}{\text{total population}}\right) \div 1000$

Crude Birth Rate: $\left(\frac{\text{total \# births}}{\text{total population}}\right) \times 1000$

Crude Death Rate: $\left(\frac{\text{total \# death}}{\text{total population}}\right) \times 1000$

Population Change: $\frac{(\text{births} + \text{immigration}) - (\text{deaths} + \text{emigration})}{\text{total population}}$

Population Growth Rate: $\left(\frac{(\text{births} + \text{immigration}) - (\text{deaths} + \text{emigration})}{\text{total population}}\right) \times 100$

Doubling Time: $\frac{70}{\%\ \text{growth rate}}$ = years to double

Rate of Change: $\frac{(\text{new-old})}{\text{old}}$

Percent Change: $\frac{(\text{new-old})}{\text{old}} \times 100$

Natural Rate of Population Increase: births-deaths