Dwelling Unit Load

1- General Lighting Load SqFt. x 3va, 1st 3,000VA = 100% , 3,001v-a-120,000va =35%, 120,001+= 25% **220.45**

2-Small Appliance & Laundry =4500va **220.52**

3-Add 1&2

4-Heat & AC Keep larger, omit smaller. **220.60**

5-Appliance Load 75% for 4 or more fixed appliances. **220.53**

6-Dryer 5000va or Nameplate rating. **220.54**

7- Demand for Cooking Equipment 8000kv between 3.5kw-12kw. Smaller use nameplate. Larger 5% per kw higher **220.55**

8-Largest motor The largest motor is 125% of FLC. Not AC unless its larger than heat. **FLC 430.248**

Size service by Dividing the total by the voltage(240). Apply table **310.12(A)**

Size Grounding Electrode Conductor 250.66

Ohm's Law and Power Formulas

P = Power= Watts	**E = Force=Volts**
I = Current = Amperes	**R = Resistance + Ohms**

Ohm's Law

VOLTAGE E(volts)=**I** Current(AMPS) X **R** Resistance(ohms)

CURRENT = Voltage ÷ Resistance

RESISTANCE = Voltage ÷ Current

Power Diagram & Formulas

POWER (Watts) = Current X Voltage

VOLTAGE = Power ÷ Current

CURRENT = Power ÷ Voltage

3 phase

Single Phase VA=V x I

Three-phase VA=√3 x V x I = 1.732 x V x I

Current (Three phase) I= (VA)÷(√3 x V)

120v = 208 __ 277v = 480

If the voltage is 208v 3Phase.. Divide VA x 1000 by 360 to get amps

If the voltage is 480v 3 phase.. divide VA x 1000 by 831 to get amps

FLA x either 360 or 831= the total VA

Top Tables Likely in Test

Bonding Jumper Sizing 250.102	Sizing main bonding jumper, system bonding jumper, and supply side bonding jumper.

Top Tables Likely in Test (cont)

EGC Sizing 250.122	Sizing EGC based on rating of Ove current protective device.
Ampacity Tables 310.15, 310.16	Ampacities of conductors. Demand factors for number of conductors. Temp corrections.
Conduit and tubing fill Ch.9 Table 4	#of conductors in a conduit or tube.
Conductor dimensions Ch.9 Table 5	Listing the dimensions, area, and resistance of insulated conductors and fixture wires.
Conductor Resistance Ch.9 Table 8	Providing DC resistance values for copper and aluminum conductors.
Branch Circuit Requirements 210.24	Summary of min requriements for common 10amp-50amp branch circuits
Grounding Conductor Identific-ation 200.6	Means of identifying grounded Conductors.
Conductors for general wiring 310.4(1)	Conductor applications and insulations rated 600 volts.

Fast Numbers

√3 = 1.732

208 x 0.03 = 6.24 v max drop

480 x 0.03 = 14.4 v max drop

208V 3Φ current = VA ÷ 360

480V 3Φ current+ VA ÷ 831

Motor VA=208V: FLA x 360|480V: FLA x 831

K = 12.9 uncoated Cu (23.3) Aluminum 21.2 (36.8)

Continuious load +1.25%

Largest motor = +125% (branch)| +25% feeder/service

VOLTAGE DROP

**Voltage drop = (2 or (1.732) x K x I x D) ÷ Circular Mils

If continious multiply 1.25 to load. Then compair on 310.16 table. then do the calculaton and compare to table 8. Highest one is the answer.