1. Mean (μ) = 100

Standard deviation (σ) = 15

To determine if 90% of population has IQ between 70 and 130:  
  
Convert to z-scores:

70- z = (70-100)/15 = -2

130-z = (130-100)/15 = 2

For P(-2 < Z < 2), we need to find the area between z = -2 and z = 2.

Area from z = -2 to z = 0

Area from z = 0 to z = 2

From the standard normal table

P(0 ≤ Z ≤ 2) = 0.4772

P(-2 ≤ Z ≤ 0) = 0.4772

Total probability: P(-2 < Z < 2) = P(-2 ≤ Z ≤ 0) + P(0 ≤ Z ≤ 2) = 0.4772 + 0.4772 = 0.9545

Therefore, the statement is incorrect. Actually more than 90% (about 95.45%) of people have IQ between 70 and 130.

B)For IQ > 125:

z = (125-100)/15 = 1.67

P(Z > 1.67) = 0.0475 or about 4.75% This means approximately 4.75% of people would be disqualified for having too high an IQ.

C)  
 z = (85-100)/15 = -1

P(Z < -1) = 0.1587 or about 15.87% About 15.87% of people would be disqualified from military service under the original standard.

D)For 80 ≤ IQ < 85:

z-scores:

* 1. For 80: z = (80-100)/15 = -1.33
  2. For 85: z = (85-100)/15 = -1

P(-1.33 < Z < -1) = 0.1587 - 0.0918 = 0.0669 or about 6.69% About 6.69% of people fall in this range.

E)For Mensa (top 2%):

1. Need to find z-score for the 98th percentile
2. z = 2.054
3. IQ = 100 + (2.054 × 15) = 130.81 Therefore, an IQ of approximately 131 is required to join Mensa.