1. The following box-whisker plot shows the distributions of total cholesterol levels in boys and girls 10-15 years of age.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | Boys |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  | Girls |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 120 | 130 | 140 | 150 | 160 | 170 | 180 | 190 | 200 | 210 | 220 | 230 | 240 | 250 | 260 | 270 |

1. What is the median total cholesterol level in boys? \_\_\_\_\_\_\_\_
2. What is Q1 for boys? \_\_\_\_\_\_\_\_
3. What is Q3 for boys? \_\_\_\_\_\_\_\_
4. Lower Limit for Outliers for boys: \_\_\_\_\_\_\_\_
5. Upper Limit for Outliers boys: \_\_\_\_\_\_\_\_
6. Are there any outliers in total cholesterol in boys? \_\_\_\_\_\_\_\_
7. What proportions of the boys have total cholesterol less than 205? \_\_\_\_\_\_\_ %
8. What proportions of the girls have total cholesterol less than 205? \_\_\_\_\_\_\_ %

2. As part of a study, investigators wanted to assess the accuracy of self-reported smoking status. Participants are asked whether they currently smoke or not. In addition, laboratory tests are performed on hair samples to determine presence or absence of nicotine. The laboratory assessment is considered the gold standard, or truth about nicotine. The data are as follows:

|  |  |  |
| --- | --- | --- |
|  | Nicotine Absent | Nicotine Present |
| Self-Reported Non-Smoker | 82 | 14 |
| Self-Reported Smoker | 12 | 52 |

1. What is the sensitivity of self-reported smoking status?
2. What is the specificity of self-reported smoking status?

3. A recent study reported that the prevalence of hyperlipidemia (defined as total cholesterol over 200) is 30% in children 2–6 years of age. If 12 children are analyzed,

* 1. What is the probability that at least 3 are hyperlipidemic?
  2. What is the probability that 3 are hyperlipidemic?
  3. How many would be expected to meet the criteria for hyperlipidemia?