Practice worksheet | Sampling and confidence intervals

# Effect of sample size and variability

Name: _____ Date: _____

6 questions | 13 marks

**1.** Margin is 5 at $n = 36$. Find it at $n = 144$. [2 marks]

**2.** A sample of 80 has a given margin. How many observations give one-third that margin? [2 marks]

**3.** SD changes from 8 to 12 with confidence and $n$ fixed. Compare widths. [2 marks]

**4.** Compare 99% and 95% widths using critical values 2.576 and 1.96. [2 marks]

**5.** Both $n$ and population SD are multiplied by four. Compare margins. [2 marks]

**6.** Use the supplied repeated-interval simulation table. Compare interval width when $n$ rises from 25 to 100 at fixed confidence. Does the observed capture fraction have to equal the advertised confidence exactly? [3 marks]

One simulation: 2,000 sample intervals per row; normal population mean 100, SD 20

| Sample size | Confidence | Captures | Capture fraction | Mean width |
|---|---|---|---|---|
| 25 | 95% | 1903 | 0.9515 | 15.680 |
| 25 | 99% | 1978 | 0.9890 | 20.608 |
| 100 | 95% | 1902 | 0.9510 | 7.840 |
| 100 | 99% | 1988 | 0.9940 | 10.304 |