

$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}} \quad z = \frac{x - \mu}{\sigma}$$

12 **Part I: Multiple Choice. Place the correct answer in the corresponding blank at the end of this section.**

1. Determine the range of the following test scores.

History Test 1 Scores (out of 100)

90	84	77	66
89	84	77	65
86	82	75	65
86	81	72	61
84	79	70	56

$$90 - 56 = 34$$

- (A) 34
(B) 56
(C) 90
(D) 78

2. Determine the mean of the following test scores.

History Test 2 Scores (out of 100)

95	85	72	62
92	84	72	59
89	80	70	52
88	78	68	40
85	73	67	32

$$\frac{1443}{20} = 72.15$$

- (A) 71.65
(B) 71.15
(C) 72.15
(D) 70.65

3. Determine the median of the following test scores.

History Test 1 Scores (out of 100)

90	84	77	66
89	84	77	65
86	82	75	65
86	81	72	61
84	79	70	56

$$\frac{79 + 77}{2} = 78$$

- (A) 78
(B) 79
(C) 56
(D) 77

4. At the end of a bowling tournament, three friends analyzed their scores. Erinn's mean bowling score is 92 with a standard deviation of 14. Declan's mean bowling score is 130 with a standard deviation of 18. Matt's mean bowling score is 116 with a standard deviation of 22. Jonas' mean bowling score is 225 with a standard deviation of 6. Who is the more consistent bowler?

- (A) Declan
 (B) Erinn
 (C) Matt
 (D) Jonas

5. The ages of participants in a bonspiel are normally distributed, with a mean of 40 and a standard deviation of 10 years. What percent of the curlers are between 40 and 50?

- (A) 68%
 (B) 95%
 (C) 16%
 (D) 34%

34%
 40 50

6. The ages of participants in a bonspiel are normally distributed, with a mean of 40 and a standard deviation of 10 years. What percent of the curlers are older than 60?

- (A) 1.25%
 (B) 5%
 (C) 0%
 (D) 2.5%

1.3σ | 1.35σ | 2.35σ | 0.15σ |
 40 50 60 →
 $2.35 + 0.15 = 2.5$

7. Determine the z-score for the given value.
 $\mu = 120, \sigma = 10, x = 125$

- (A) -2
 (B) 0.5
 (C) 2
 (D) -0.5

$$z = \frac{125 - 120}{10} = 0.5$$

8. Determine the percent of data to the left of the z-score: $z = 1.44$.

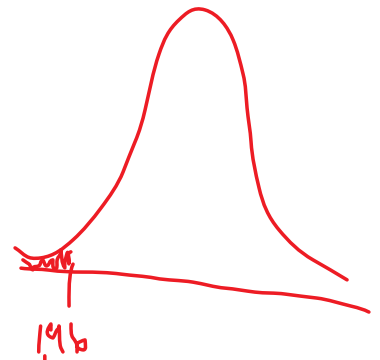
- (A) 94.95%
 (B) 92.51%
 (C) 93.82%
 (D) 95.91%

0.9251
 92.51%

9. Determine the percent of data to the right of the z-score: $z = -1.96$.

- (A) 2.50%
 (B) 97.50%
 (C) 1.50%
 (D) 98.50%

0.0250
 $1 - 0.0250 = 0.9750$



10. Determine the percent of data between the following z -scores:
 $z = -0.45$ and $z = -0.15$.

- (A) 76.68%
(B) 44.04%
(C) 32.64%
(D) 11.40%

$$\begin{aligned} & -0.3264 + 0.4404 \\ & = 0.114 \\ & \text{or } 11.4\% \end{aligned}$$

11. A poll was conducted about an upcoming election. The result that 44% of people intend to vote for one of the candidates is considered accurate within ± 2.7 percent points, 19 times out of 20. State the confidence interval.

- (A) 41.3%–46.7%
(B) 42.65%–45.35%
(C) 44%–46.7%
(D) 41.3%–44%

$$\begin{aligned} 44 - 2.7 &= 41.3 \\ 44 + 2.7 &= 46.7 \end{aligned}$$

12. The results of a survey have a confidence interval of 56.0% to 64.6%, 9 times out of 10. Determine the margin of error.

- (A) $\pm 64.6\%$
(B) $\pm 16.6\%$
(C) $\pm 8.3\%$
(D) $\pm 56.0\%$

Answers to multiple choice.

1.____ 2.____ 3.____ 4.____ 5.____

6.____ 7.____ 8.____ 9.____ 10.____

11.____ 12.____

21

Part II: Constructed Response. Answer each question in the space provided. Show all workings.

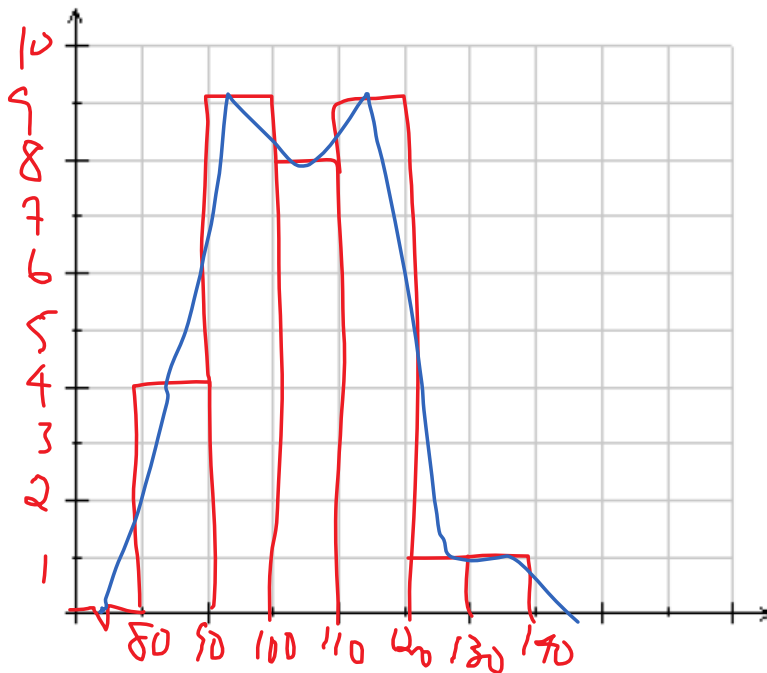
13. An apple orchard has 32 trees with these heights, given in inches.

116 90 91 99 114 110 124 102
 82 89 104 102 95 105 118 118
 110 97 92 93 91 116 101 101
 116 86 101 83 117 93 132 104

3 (A) Complete the frequency table.

Height (in.)	Frequency
80-90	1111 4
90-100	5
100-110	6
110-120	5
120-130	1
130-140	1

3 (B) Construct a histogram and frequency polygon.



14. Sarena keeps track of the amount she spends, in dollars, on weekly lunches for 5 weeks:

18 24 27 24 31

4 (A) Determine the range, mean, median and mode correct to one decimal place.

$$\text{Range: } 31 - 18 = 13$$

$$\text{mean: } 24.8$$

$$\text{median: } 24$$

$$\text{mode: } 24$$

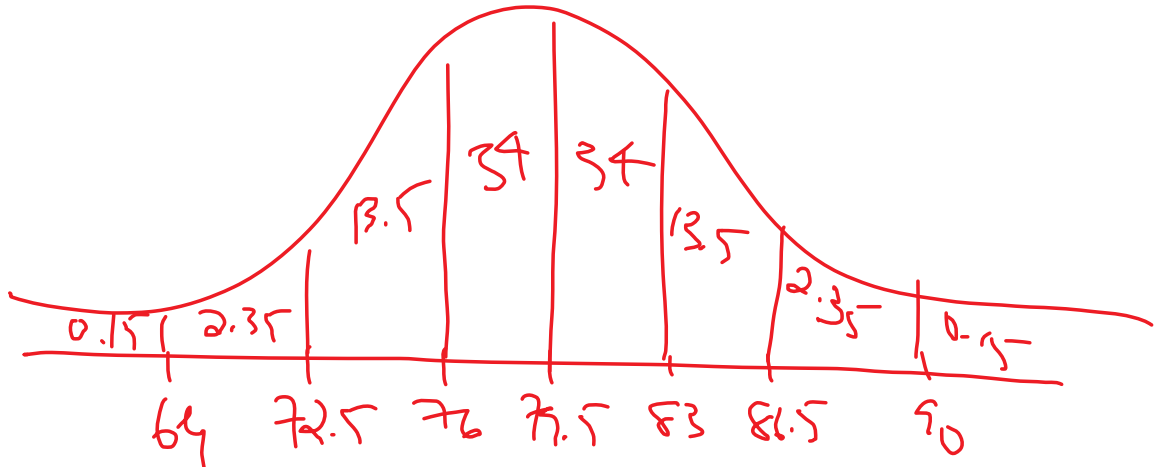
3 (B) Determine the standard deviation for the data.

Data Point (x)	Data Point - Mean ($x - \bar{x}$)	(Data Point - Mean) ² ($x - \bar{x}$) ²
18	$18 - 24.8 = -6.8$	$(-6.8)^2 = 46.24$
24		0.64
24		0.64
27		4.64
31		38.44
		$\Sigma(x - \bar{x})^2 = 90.8$

$$s = \sqrt{\frac{90.8}{5}} = 4.26$$

15. A teacher is analyzing the class results for a computer science test. The marks are normally distributed with a mean, μ , of 79.5 and a standard deviation, σ , of 3.5.

3 (A) Sketch the normal curve for the test.



1 (B) What percentage of students scored between and 76% and 86.5%

$$34\% + 34\% + 13.5\% = 81.5\%$$

4 16. A tile company produces glass kitchen tiles that has an average thickness of 71 mm, with a standard deviation of 0.4 mm. For premium-quality tiles, the tiles must have a thickness between 70 mm and 71.5 mm. What percent, to the nearest whole number, of the total production can be sold as premium-quality tiles?

$$z = \frac{70 - 71}{0.4}$$

$$z = -2.5$$

$$0.0062$$

$$z = \frac{71.5 - 71}{0.4}$$

$$z = 1.25$$

$$0.8944$$

$$0.8944 - 0.0062$$

$$= 0.8882$$

$$89\%$$