Think ahead. Analyze data. Make smart decisions. You've got this!

PROBABILISTIC & STATISTICAL REASONING

for the TSIA2 Math Test

Probability in action!

- Understand data.
- Use statistics.
- Make informed choices.

Knowledge today. Success tomorrow!

1 DATA ANALYSIS

Data is everywhere! Collect it, organize it, and look for patterns.

EXAMPLE DATA SET

Hours of Study for a Test

2	3	4	2	5
3	1	4	3	2

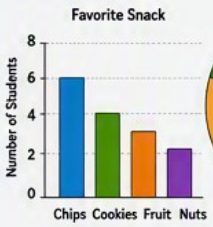
Organize • Sort • Summarize • Interpret

TIP: Always ask—
What is the data trying to tell me?

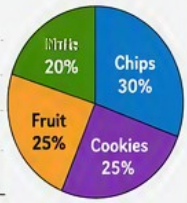
2 GRAPHS & CHARTS

Graphs turn data into pictures we can understand!

BAR CHART



PIE CHART



Use graphs to compare, show relationships, and draw conclusions.

3 MEASURES OF CENTER

The center is the typical or middle value of a data set.

MEAN (average)

Add all values and divide by the number of values.

$$\bar{x} = \frac{\text{sum of values}}{n}$$

MEDIAN (middle)

Order the data. The middle value is the median.

1, 2, 4, 4, 7
(4)

MODE (most often)

The value that appears most frequently.

2, 2, 3, 2, 4, 2
(2)

TIP: Know when to use mean, median, or mode!

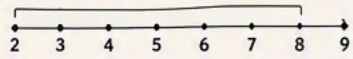
4 MEASURES OF SPREAD

Spread shows how data values vary or are spread out.

RANGE

Largest value – Smallest value

Example: 9 – 2 = 7



IQR (Interquartile Range)

Middle 50% of the data

$IQR = Q_3 - Q_1$

VARIANCE & STANDARD DEVIATION

Measure how far data values are from the mean.

Larger value = more spread.

TIP: Small spread = consistent.
Large spread = more variability.

5 BASIC PROBABILITY

Probability tells us how likely an event is to happen.

FORMULA

$$\text{Probability of an event} = \frac{\text{Number of favorable outcomes}}{\text{Total number of possible outcomes}}$$

EXAMPLES

1) Roll a fair die. What is P(6)?
There is 1 favorable outcome (6) out of 6 possible outcomes.

$P(6) = \frac{1}{6}$

2) Draw a heart from a deck of cards.
There are 13 hearts out of 52 cards.

$P(\text{heart}) = \frac{13}{52} = \frac{1}{4}$

TIP: Look for what can happen and how many ways!

6 INTERPRETING STATISTICAL RESULTS

Go beyond the numbers—make meaning from the data.

- Look at the context.
  What is the data about?
- Check for trends and patterns.
  What stands out?
- Be aware of outliers.
  Do any values seem unusual?
- Consider variability.
  Is the data consistent?
- Draw a conclusion.
  What does the data suggest?
  What are the limitations?

TIP: Good conclusions are based on data, not opinions!

PRACTICE. ANALYZE. SUCCEED!

You have the tools. You have the skills. You can do this!

STUDY SMART
Review concepts regularly and take practice tests.

FOCUS
Break problems into steps and take your time.

STAY CONFIDENT
Mistakes help you learn. Keep going—you're improving!

BELIEVE IN YOU
Every problem you solve brings you closer to your goals!

Your effort today creates your success tomorrow!

★ PREPARE TODAY. ACHIEVE TOMORROW. CRUSH THE TSIA2! ★