LATEPASS.COM

Statistics Readiness Packet

Rising 12th Graders • 60 Days • 5 Questions Per Day

Student Name: _____

Teacher / Parent: _____

Answers are located at the back of this packet.

How to Use This Packet

This packet prepares rising 12th graders for Statistics by reviewing the essential algebra, data analysis, and probability foundations needed for success. Complete one page (5 questions) per day for 60 days.

Tips for Success:

- Complete one day per day — no rush, no pressure!
- Show all work — don't just write the final answer.
- Try all 5 questions before checking the Answer Key.
- The Answer Key is at the back — use it to check work after each day.
- Review any missed concepts before moving on to the next day.

Topics by Week:

Week 1	Algebra Foundations — Order of Operations, Solving Equations & Ratios/Proportions
Week 2	Number Sense — Percent Applications, Rounding, Absolute Value & Exponents
Week 3	Data Types & Collecting Data — Populations, Samples & Sampling Methods
Week 4	Organizing & Displaying Data — Frequency Tables, Bar Graphs, Histograms & Stem-Plots
Week 5	Measures of Center & Spread — Mean, Median, Mode, Range & Standard Deviation
Week 6	Five-Number Summary, Box Plots, IQR & Outliers
Week 7	Distribution Shape, the Normal Distribution & Z-Scores
Week 8	Scatterplots & Correlation
Week 9	Linear Regression — Predictions, r^2 & Correlation vs. Causation
Week 10	Probability Basics — Sample Spaces, Complements & Conditional Probability
Week 11	Random Variables, Expected Value & Sampling Distributions
Week 12	Comprehensive Statistics Readiness Review

Day 1 — Order of Operations & Evaluating Expressions

Name: _____

1. Evaluate: $3 + 4 \times 2^2$

Answer: _____

2. Evaluate: $(5 - 2) \times (8 - 6)$

Answer: _____

3. Evaluate $2x + 3$ when $x = 5$.

Answer: _____

4. Evaluate $x^2 - 4$ when $x = -3$.

Answer: _____

5. Simplify: $12 \div 3 + 2 \times 5$

Answer: _____

Score: ____ / 5

Day 2 — Fractions, Decimals & Percents

Name: _____

1. Convert 3/8 to a decimal.

Answer: _____

2. Convert 0.45 to a percent.

Answer: _____

3. What is 20% of 150?

Answer: _____

4. Convert 5/4 to a percent.

Answer: _____

5. Add: 1/4 + 1/6

Answer: _____

Score: ____ / 5

Day 3 — Solving Linear Equations

Name: _____

1. Solve: $2x + 5 = 17$

Answer: _____

2. Solve: $3(x - 2) = 9$

Answer: _____

3. Solve: $x/4 = 7$

Answer: _____

4. Solve: $5x - 3 = 2x + 9$

Answer: _____

5. Solve: $-2x + 8 = 0$

Answer: _____

Score: ____ / 5

Day 4 — Ratios, Rates & Proportions

Name: _____

1. Simplify the ratio 18:24 to lowest terms.

Answer: _____

2. Solve the proportion: 4/5 = x/20

Answer: _____

3. A car travels 150 miles in 3 hours. Find its rate in miles per hour.

Answer: _____

4. If 2 cups of flour make 12 cookies, how many cups are needed for 30 cookies?

Answer: _____

5. Solve: x/8 = 3/4

Answer: _____

Score: ____ / 5

Day 5 — Mixed Review — Week 1

Name: _____

1. Evaluate: $4^2 - 3 \times 2$

Answer: _____

2. What is 15% of 200?

Answer: _____

3. Solve: $3x + 1 = 16$

Answer: _____

4. Convert 7/10 to a percent.

Answer: _____

5. Solve the proportion: $6/9 = x/15$

Answer: _____

Score: ____ / 5

Day 6 — Percent Change & Percent Error

Name: _____

1. A price increases from $50 to $60. Find the percent increase.

Answer: _____

2. A population decreases from 200 to 150. Find the percent decrease.

Answer: _____

3. The actual value is 50, but the measured value is 47. Find the percent error.

Answer: _____

4. An item is marked down 25% from $80. Find the sale price.

Answer: _____

5. A value increases from 40 to 50. Find the percent increase.

Answer: _____

Score: ____ / 5

Day 7 — Rounding & Number Sense

Name: _____

1. Round 3.14159 to two decimal places.

Answer: _____

2. Round 247.6 to the nearest ten.

Answer: _____

3. Round 0.0853 to three decimal places.

Answer: _____

4. Round 18.46 to the nearest whole number.

Answer: _____

5. Round 5.995 to two decimal places.

Answer: _____

Score: ____ / 5

Day 8 — Negative Numbers & Absolute Value (Deviations)

Name: _____

1. Evaluate: $|-12|$

Answer: _____

2. Evaluate: $|7 - 15|$

Answer: _____

3. Compute: $-5 + (-3)$

Answer: _____

4. Compute: $8 - (-4)$

Answer: _____

5. Evaluate: $|3 - 3|$

Answer: _____

Score: ____ / 5

Day 9 — Exponents, Square Roots & Scientific Notation

Name: _____

1. Evaluate: 5^2

Answer: _____

2. Evaluate: $\sqrt{81}$

Answer: _____

3. Evaluate: 2^3

Answer: _____

4. Write 3,400,000 in scientific notation.

Answer: _____

5. Evaluate: $\sqrt{(16 + 9)}$

Answer: _____

Score: ____ / 5

Day 10 — Mixed Review — Week 2

Name: _____

1. A score increases from 80 to 92. Find the percent increase.

Answer: _____

2. Round 6.378 to one decimal place.

Answer: _____

3. Evaluate: $|-6| + |-2|$

Answer: _____

4. Evaluate: $\sqrt{64}$

Answer: _____

5. A $40 item is discounted 10%. Find the new price.

Answer: _____

Score: ____ / 5

Day 11 — Categorical vs. Quantitative Data

Name: _____

1. Is “favorite color” categorical or quantitative data?

Answer: _____

2. Is “number of siblings” categorical or quantitative data?

Answer: _____

3. Is “height in inches” categorical or quantitative data?

Answer: _____

4. Give an example of a categorical variable.

Answer: _____

5. Is “zip code” categorical or quantitative data, even though it is written using numbers?

Answer: _____

Score: ____ / 5

Day 12 — Population vs. Sample

Name: _____

1. Define “population” in statistics.

Answer: _____

2. Define “sample” in statistics.

Answer: _____

3. A researcher surveys 200 of the 5,000 students at a school. What is the sample size?

Answer: _____

4. Why do researchers often use samples instead of studying the entire population?

Answer: _____

5. What is a “census”?

Answer: _____

Score: ____ / 5

Day 13 — Sampling Methods

Name: _____

1. What is a simple random sample?

Answer: _____

2. What is stratified sampling?

Answer: _____

3. What is convenience sampling, and why is it often unreliable?

Answer: _____

4. What is a systematic sample?

Answer: _____

5. Name one source of bias in a voluntary response survey.

Answer: _____

Score: ____ / 5

Day 14 — Observational Studies vs. Experiments

Name: _____

1. What is the key difference between an observational study and an experiment?

Answer: _____

2. What is a confounding variable?

Answer: _____

3. What is the purpose of a control group?

Answer: _____

4. What does randomization in an experiment help control for?

Answer: _____

5. What is a placebo, and why is it used?

Answer: _____

Score: ____ / 5

Day 15 — Mixed Review — Week 3

Name: _____

1. Is “temperature in degrees” categorical or quantitative data?

Answer: _____

2. A pollster only surveys people leaving a movie theater. What sampling method is this, and what is the issue?

Answer: _____

3. What is the difference between a population and a sample?

Answer: _____

4. In a drug experiment, what is the role of the control group?

Answer: _____

5. What sampling method involves dividing the population into groups and sampling from each group?

Answer: _____

Score: ____ / 5

Day 16 — Frequency Tables & Relative Frequency

Name: _____

1. A class has these grades: A, A, B, C, B, B, A, C. How many students earned a B?

Answer: _____

2. Using the same data (8 students), what is the relative frequency of A?

Answer: _____

3. What is the difference between frequency and relative frequency?

Answer: _____

4. If a frequency table shows 12 out of 40 people chose “Yes,” find the relative frequency.

Answer: _____

5. What should the relative frequencies in a complete frequency table sum to?

Answer: _____

Score: ____ / 5

Day 17 — Bar Graphs & Pie Charts

Name: _____

1. What type of data (categorical or quantitative) is best displayed with a bar graph?

Answer: _____

2. In a pie chart, what does each slice represent?

Answer: _____

3. A pie chart slice represents 25% of 200 people. How many people does it represent?

Answer: _____

4. What is the main difference between a bar graph and a histogram?

Answer: _____

5. A bar graph shows sales of 30, 45, 25, and 50 units for four products. Find the total sales.

Answer: _____

Score: ____ / 5

Day 18 — Histograms & Dot Plots

Name: _____

1. What does the height of a bar in a histogram represent?

Answer: _____

2. If a histogram has bins of width 10 starting at 0, which bin would the value 23 fall into?

Answer: _____

3. What does a dot plot show?

Answer: _____

4. In a dot plot, there are 4 dots above the value 7. What does this mean?

Answer: _____

5. What is a “bin” (or “class”) in a histogram?

Answer: _____

Score: ____ / 5

Day 19 — Stem-and-Leaf Plots & Frequency Distributions

Name: _____

1. For the value 47, identify the stem and the leaf.

Answer: _____

2. A stem-and-leaf plot shows stem 2 with leaves 1, 4, 5. List the data values represented.

Answer: _____

3. What is an advantage of a stem-and-leaf plot over a histogram?

Answer: _____

4. In a frequency distribution table, what does the cumulative frequency represent?

Answer: _____

5. If class intervals are 0–9, 10–19, and 20–29, which interval contains the value 19?

Answer: _____

Score: ____ / 5

Day 20 — Mixed Review — Weeks 1–4

Name: _____

1. Solve: 4x − 7 = 13

Answer: _____

2. What is 30% of 90?

Answer: _____

3. Is “shoe size” best classified as quantitative data?

Answer: _____

4. What does the height of a histogram bar represent?

Answer: _____

5. A pie chart slice is 40% of 50 people. How many people is that?

Answer: _____

Score: ____ / 5

Day 21 — Mean, Median & Mode

Name: _____

1. Find the mean of: 4, 8, 6, 10, 12

Answer: _____

2. Find the median of: 3, 7, 9, 12, 15

Answer: _____

3. Find the mode of: 2, 5, 5, 7, 9

Answer: _____

4. Find the median of: 2, 4, 6, 8

Answer: _____

5. Find the mean of: 10, 20, 30, 40

Answer: _____

Score: ____ / 5

Day 22 — Range & Variability

Name: _____

1. Find the range of: 10, 25, 18, 4, 30

Answer: _____

2. If a data set has a small range, what does that suggest about the data?

Answer: _____

3. Find the range of: 100, 102, 98, 101, 99

Answer: _____

4. Why is the range considered a weak measure of spread?

Answer: _____

5. Find the range of: −5, 0, 8, −2, 3

Answer: _____

Score: ____ / 5

Day 23 — Variance & Standard Deviation (Concepts)

Name: _____

1. What does standard deviation measure?

Answer: _____

2. Find the mean of: 2, 4, 6, 8

Answer: _____

3. Find the deviations from the mean for the data set 2, 4, 6, 8 (mean = 5).

Answer: _____

4. Two data sets have the same mean, but Set A has a larger standard deviation than Set B. What does this tell you?

Answer: _____

5. Can the standard deviation ever be negative?

Answer: _____

Score: ____ / 5

Day 24 — Effects of Outliers on Center & Spread

Name: _____

1. A data set is 2, 3, 4, 5, 100. Which measure of center is more affected by the outlier: the mean or the median?

Answer: _____

2. Find the mean of: 2, 3, 4, 5, 100

Answer: _____

3. Find the median of: 2, 3, 4, 5, 100

Answer: _____

4. If an outlier is removed from a data set, what typically happens to the range?

Answer: _____

5. Why is the median often preferred over the mean for skewed data?

Answer: _____

Score: ____ / 5

Day 25 — Mixed Review — Week 5

Name: _____

1. Find the mean of: 5, 10, 15, 20, 25

Answer: _____

2. Find the median of: 1, 3, 3, 6, 7, 8, 9

Answer: _____

3. Find the range of: 12, 45, 7, 30

Answer: _____

4. Find the mode of: 4, 4, 6, 8, 8, 8

Answer: _____

5. A data set has an outlier. Which measure of center is less affected: the mean or the median?

Answer: _____

Score: ____ / 5

Day 26 — Quartiles & the Five-Number Summary

Name: _____

1. Find the median (Q2) of: 4, 8, 15, 16, 23, 42

Answer: _____

2. For the same data (4, 8, 15, 16, 23, 42), find Q1 (the lower quartile).

Answer: _____

3. For the same data, find Q3 (the upper quartile).

Answer: _____

4. List the parts of the five-number summary in order.

Answer: _____

5. Find the minimum and maximum of: 7, 12, 3, 19, 25

Answer: _____

Score: ____ / 5

Day 27 — Interquartile Range (IQR) & Outliers

Name: _____

1. Find the IQR if Q1 = 10 and Q3 = 22.

Answer: _____

2. What is the formula for the lower outlier boundary using the IQR?

Answer: _____

3. What is the formula for the upper outlier boundary using the IQR?

Answer: _____

4. If Q1 = 20 and Q3 = 30 (IQR = 10), is the value 50 an outlier?

Answer: _____

5. If Q1 = 5 and Q3 = 15 (IQR = 10), find the lower outlier boundary.

Answer: _____

Score: ____ / 5

Day 28 — Box Plots (Box-and-Whisker Plots)

Name: _____

1. What do the “whiskers” of a box plot represent?

Answer: _____

2. What does the box itself represent in a box plot?

Answer: _____

3. What does the line inside the box represent?

Answer: _____

4. A box plot has a long right whisker and a short left whisker. What does this suggest about the data’s shape?

Answer: _____

5. How are outliers typically shown on a box plot?

Answer: _____

Score: ____ / 5

Day 29 — Comparing Distributions with Box Plots

Name: _____

1. Two box plots have the same median but different IQRs. What does this tell you?

Answer: _____

2. Box Plot A is positioned further left than Box Plot B. What does this suggest?

Answer: _____

3. What measure of center is shown on a box plot?

Answer: _____

4. Can you determine the exact mean of a data set from a box plot?

Answer: _____

5. If a box plot is symmetric, what does that suggest about Q1, the median, and Q3?

Answer: _____

Score: ____ / 5

Day 30 — Mixed Review — Weeks 5-6

Name: _____

1. Find the IQR for data with Q1 = 8 and Q3 = 25.

Answer: _____

2. Find the median of: 6, 9, 11, 14, 18

Answer: _____

3. Is the value 100 an outlier if Q1 = 20 and Q3 = 40 (IQR = 20)?

Answer: _____

4. What does the box in a box plot represent?

Answer: _____

5. Find the mean of: 3, 6, 9, 12

Answer: _____

Score: ____ / 5

Day 31 — Describing Distribution Shape

Name: _____

1. What does it mean for a distribution to be symmetric?

Answer: _____

2. What does it mean for a distribution to be skewed right?

Answer: _____

3. What does it mean for a distribution to be skewed left?

Answer: _____

4. In a right-skewed distribution, which is typically larger: the mean or the median?

Answer: _____

5. What is a bimodal distribution?

Answer: _____

Score: ____ / 5

Day 32 — The Normal Distribution & the 68-95-99.7 Rule

Name: _____

1. What shape describes the normal distribution?

Answer: _____

2. According to the Empirical Rule, about what percent of data falls within 1 standard deviation of the mean?

Answer: _____

3. About what percent of data falls within 2 standard deviations of the mean?

Answer: _____

4. About what percent of data falls within 3 standard deviations of the mean?

Answer: _____

5. In a normal distribution, how does the mean compare to the median?

Answer: _____

Score: ____ / 5

Day 33 — Z-Scores

Name: _____

1. What does a z-score measure?

Answer: _____

2. A data set has mean 50 and standard deviation 5. Find the z-score for a value of 60.

Answer: _____

3. Using the same mean and standard deviation, find the z-score for a value of 45.

Answer: _____

4. If a data value has a z-score of 0, what does that tell you about the value?

Answer: _____

5. A test score has a z-score of −2. What does this indicate about the score?

Answer: _____

Score: ____ / 5

Day 34 — Applying the Normal Distribution

Name: _____

1. A data set is normally distributed with mean 100 and standard deviation 15. Between what two values do about 68% of the data fall?

Answer: _____

2. Using the same distribution (mean 100, sd 15), between what two values do about 95% of the data fall?

Answer: _____

3. In a normal distribution, what percent of the data is below the mean?

Answer: _____

4. Using the Empirical Rule, about what percent of the data falls below a value with a z-score of 1?

Answer: _____

5. If the mean is 20 and the standard deviation is 4, find the value with a z-score of −1.5.

Answer: _____

Score: ____ / 5

Day 35 — Mixed Review — Week 7

Name: _____

1. A distribution’s tail extends to the left. Describe its shape.

Answer: _____

2. According to the Empirical Rule, about what percent of data is within 2 standard deviations of the mean?

Answer: _____

3. A data set has mean 70 and standard deviation 10. Find the z-score for a value of 85.

Answer: _____

4. In a right-skewed distribution, is the median typically greater than or less than the mean?

Answer: _____

5. If the mean is 50 and the standard deviation is 8, find the value with a z-score of 2.

Answer: _____

Score: ____ / 5

Day 36 — Reading Scatterplots

Name: _____

1. What does a scatterplot show?

Answer: _____

2. What does it mean if points on a scatterplot trend upward from left to right?

Answer: _____

3. What does it mean if points trend downward from left to right?

Answer: _____

4. What does it mean if a scatterplot shows no clear pattern?

Answer: _____

5. In a scatterplot, which variable is typically placed on the x-axis?

Answer: _____

Score: ____ / 5

Day 37 — The Correlation Coefficient (r)

Name: _____

1. What is the range of possible values for the correlation coefficient r?

Answer: _____

2. What does r = 1 indicate?

Answer: _____

3. What does r = −1 indicate?

Answer: _____

4. What does r = 0 indicate?

Answer: _____

5. Which value indicates a stronger linear relationship: r = 0.85 or r = 0.4?

Answer: _____

Score: ____ / 5

Day 38 — Line of Best Fit (Linear Model)

Name: _____

1. What is the purpose of a line of best fit?

Answer: _____

2. A line of best fit is y = 2x + 5. Find the predicted value of y when x = 10.

Answer: _____

3. In the equation y = 2x + 5, what does the slope (2) represent in context?

Answer: _____

4. In the equation y = 2x + 5, what does the y-intercept (5) represent?

Answer: _____

5. Using y = 3x − 1, find the predicted value when x = 4.

Answer: _____

Score: ____ / 5

Day 39 — Residuals

Name: _____

1. What is a residual?

Answer: _____

2. The observed value is 50 and the predicted value is 45. Find the residual.

Answer: _____

3. What does a residual plot help you check?

Answer: _____

4. If a residual is negative, what does that mean?

Answer: _____

5. What pattern in a residual plot suggests a linear model is NOT appropriate?

Answer: _____

Score: ____ / 5

Day 40 — Mixed Review — Weeks 7–8

Name: _____

1. A value has a z-score of −1. About what percentile does this correspond to, using the Empirical Rule?

Answer: _____

2. Does r = −0.9 indicate a strong or weak relationship?

Answer: _____

3. Using y = 4x + 2, find the predicted value when x = 3.

Answer: _____

4. The observed value is 30 and the predicted value is 35. Find the residual.

Answer: _____

5. What does a scatterplot with points trending downward indicate?

Answer: _____

Score: ____ / 5

Day 41 — Interpreting Regression Output

Name: _____

1. A regression equation is height = 50 + 2(age). Interpret the slope in context.

Answer: _____

2. Using the same equation, find the predicted height for age = 10.

Answer: _____

3. What does the y-intercept represent in the equation height = 50 + 2(age)?

Answer: _____

4. What does it mean if a regression model has $r^2 = 0.81$?

Answer: _____

5. What is extrapolation, and why is it risky?

Answer: _____

Score: ____ / 5

Day 42 — The Coefficient of Determination (r^2)

Name: _____

1. If $r = 0.6$, find r^2.

Answer: _____

2. If $r^2 = 0.49$, find the possible values of r.

Answer: _____

3. What does r^2 measure?

Answer: _____

4. Can r^2 ever be negative?

Answer: _____

5. If $r^2 = 0.9$, is the linear model a good fit for the data?

Answer: _____

Score: ____ / 5

Day 43 — Influential Points & Correlation vs. Causation

Name: _____

1. What is an influential point in a regression context?

Answer: _____

2. Does a strong correlation between two variables imply that one causes the other?

Answer: _____

3. What is a lurking variable?

Answer: _____

4. Give an example of two variables that are correlated but not causally related.

Answer: _____

5. Why might removing an outlier significantly change the correlation coefficient?

Answer: _____

Score: ____ / 5

Day 44 — Making Predictions with Regression Equations

Name: _____

1. Using y = 1.5x + 10, predict y when x = 6.

Answer: _____

2. Using y = −2x + 100, predict y when x = 20.

Answer: _____

3. A regression equation predicts test scores from study hours: score = 60 + 5(hours). Predict the score for 4 hours of studying.

Answer: _____

4. If a regression line has a negative slope, what does that tell you about the relationship between x and y?

Answer: _____

5. Using score = 60 + 5(hours), how many hours of studying would predict a score of 90?

Answer: _____

Score: ____ / 5

Day 45 — Mixed Review — Week 9

Name: _____

1. If r = 0.8, find r^2.

Answer: _____

2. Using y = 3x + 4, predict y when x = 5.

Answer: _____

3. What does a lurking variable do?

Answer: _____

4. Does correlation imply causation?

Answer: _____

5. Interpret the slope of y = 2x + 5 where x = hours studied and y = test score.

Answer: _____

Score: ____ / 5

Day 46 — Sample Spaces & Simple Probability

Name: _____

1. A fair six-sided die is rolled. Find P(rolling a 4).

Answer: _____

2. A bag has 5 red and 3 blue marbles. Find P(drawing a blue marble).

Answer: _____

3. List the sample space for flipping a coin twice.

Answer: _____

4. A spinner has 4 equal sections numbered 1–4. Find P(landing on an even number).

Answer: _____

5. What is the probability of an impossible event?

Answer: _____

Score: ____ / 5

Day 47 — The Complement & Addition Rule

Name: _____

1. If P(A) = 0.3, find P(not A).

Answer: _____

2. A fair die is rolled. Find P(rolling a 1 or a 2).

Answer: _____

3. For two mutually exclusive events, P(A) = 0.2 and P(B) = 0.5. Find P(A or B).

Answer: _____

4. A standard deck has 52 cards. Find P(drawing a heart or a spade).

Answer: _____

5. If P(rain today) = 0.25, find P(no rain today).

Answer: _____

Score: ____ / 5

Day 48 — Independent & Dependent Events

Name: _____

1. What does it mean for two events to be independent?

Answer: _____

2. Two fair coins are flipped. Find P(both land heads).

Answer: _____

3. A bag has 4 red and 6 blue marbles. One marble is drawn and not replaced before a second is drawn. Are these two draws independent?

Answer: _____

4. A fair die is rolled twice. Find P(rolling a 6 both times).

Answer: _____

5. If P(A) = 0.5, P(B) = 0.4, and A and B are independent, find P(A and B).

Answer: _____

Score: ____ / 5

Day 49 — Conditional Probability

Name: _____

1. What does P(B | A) represent?

Answer: _____

2. A bag has 3 red and 2 blue marbles. One is drawn and not replaced. Find P(second marble is red | first marble is red).

Answer: _____

3. If P(A and B) = 0.12 and P(A) = 0.3, find P(B | A).

Answer: _____

4. In a class, 60% of students play sports and 30% play sports and an instrument. Find P(plays an instrument | plays sports).

Answer: _____

5. If two events A and B are independent, what is P(B | A)?

Answer: _____

Score: ____ / 5

Day 50 — Mixed Review — Week 10 (Two-Way Tables)

Name: _____

1. A two-way table shows 40 students total; 25 like math. Find P(likes math).

Answer: _____

2. Of the 25 students who like math, 10 also like science. Find P(likes science | likes math).

Answer: _____

3. A fair die is rolled. Find P(rolling an odd number).

Answer: _____

4. If P(A) = 0.6 and P(B) = 0.5 are independent, find P(A and B).

Answer: _____

5. Find P(not rolling a 6) on a fair die.

Answer: _____

Score: ____ / 5

Day 51 — Random Variables & Probability Distributions

Name: _____

1. What is a random variable?

Answer: _____

2. What is the difference between a discrete and a continuous random variable?

Answer: _____

3. A probability distribution lists outcomes 1, 2, 3 with probabilities 0.2, 0.5, 0.3. Is this a valid probability distribution?

Answer: _____

4. For the distribution in the previous question, find $P(X \geq 2)$.

Answer: _____

5. What must be true of all probabilities in a valid probability distribution?

Answer: _____

Score: ____ / 5

Day 52 — Expected Value

Name: _____

1. A game pays $10 with probability 0.2 and $0 otherwise. Find the expected value.

Answer: _____

2. A random variable X takes values 1, 2, 3 with probabilities 0.5, 0.3, 0.2. Find E(X).

Answer: _____

3. What does the expected value of a random variable represent?

Answer: _____

4. A spinner pays $5 for landing on red (probability 0.25) and $0 otherwise. Find the expected value.

Answer: _____

5. A fair die is rolled and you win $1 per pip (the number rolled). Find the expected winnings.

Answer: _____

Score: ____ / 5

Day 53 — The Law of Large Numbers & Simulation

Name: _____

1. What does the Law of Large Numbers state?

Answer: _____

2. A fair coin is flipped 10 times and lands heads 8 times. Does this contradict the Law of Large Numbers?

Answer: _____

3. What is the purpose of a simulation in statistics?

Answer: _____

4. As the number of die rolls increases, the proportion of 6’s rolled should approach what value?

Answer: _____

5. Why do casinos rely on the Law of Large Numbers to ensure profitability?

Answer: _____

Score: ____ / 5

Day 54 — Sampling Variability & Sampling Distributions

Name: _____

1. What is a sampling distribution?

Answer: _____

2. As sample size increases, what happens to the spread of sample means in a sampling distribution?

Answer: _____

3. What is sampling variability?

Answer: _____

4. According to the Central Limit Theorem, what shape does the sampling distribution of the sample mean approach as sample size increases?

Answer: _____

5. Why does increasing sample size generally make a sample statistic a more reliable estimate?

Answer: _____

Score: ____ / 5

Day 55 — Mixed Review — Week 11

Name: _____

1. A random variable has values 0, 1, 2 with probabilities 0.4, 0.4, 0.2. Find E(X).

Answer: _____

2. What does the Law of Large Numbers describe?

Answer: _____

3. What is a sampling distribution?

Answer: _____

4. Is “number of heads in 10 coin flips” a discrete or continuous random variable?

Answer: _____

5. If P(X=1) = 0.3 and P(X=2) = 0.5, find P(X=3) so the distribution is valid.

Answer: _____

Score: ____ / 5

Day 56 — Comprehensive Review I

Name: _____

1. Find the mean of: 4, 6, 8, 10, 12

Answer: _____

2. Solve: 3x − 5 = 10

Answer: _____

3. Is “type of pet owned” categorical or quantitative data?

Answer: _____

4. Find the IQR if Q1 = 12 and Q3 = 28.

Answer: _____

5. What is 25% of 80?

Answer: _____

Score: ____ / 5

Day 57 — Comprehensive Review II

Name: _____

1. A data set has mean 50 and standard deviation 5. Find the z-score for a value of 60.

Answer: _____

2. What does r = −0.8 indicate about a relationship?

Answer: _____

3. Find the median of: 3, 7, 8, 12, 20

Answer: _____

4. A fair coin is flipped twice. Find P(at least one heads).

Answer: _____

5. Using y = 2x + 3, predict y when x = 7.

Answer: _____

Score: ____ / 5

Day 58 — Comprehensive Review III

Name: _____

1. According to the Empirical Rule, about what percent of data falls within 1 standard deviation of the mean?

Answer: _____

2. Find the range of: 14, 22, 9, 30, 18

Answer: _____

3. If P(A) = 0.4 and P(B) = 0.3 and A, B are independent, find P(A and B).

Answer: _____

4. What is the difference between a population and a sample?

Answer: _____

5. Find the mode of: 3, 5, 5, 7, 7, 7, 9

Answer: _____

Score: ____ / 5

Day 59 — Comprehensive Review IV

Name: _____

1. If $r^2 = 0.64$ and the relationship is positive, find r.

Answer: _____

2. Find the five-number summary of: 2, 4, 6, 8, 10, 12, 14

Answer: _____

3. A bag has 4 red and 6 blue marbles. Find P(red).

Answer: _____

4. What is the formula for the upper outlier boundary using the IQR?

Answer: _____

5. Solve: $2x + 7 = 19$

Answer: _____

Score: ____ / 5

Day 60 — Statistics Ready! (Final Comprehensive Review)

Name: _____

1. What does a small standard deviation indicate about a data set?

Answer: _____

2. A scatterplot shows a strong positive association. What does that suggest about r?

Answer: _____

3. Find the mean, median, and mode of: 5, 5, 7, 9, 14

Answer: _____

4. What is the difference between an observational study and an experiment?

Answer: _____

5. A normal distribution has mean 100 and standard deviation 10. Between what two values do about 95% of the values fall?

Answer: _____

Score: ____ / 5

ANSWER KEY

LatePass.com Statistics Readiness Packet — Rising 12th Grade

Check your answers after completing each day!

Day 1 — Order of Operations & Evaluating Expressions

1. 11
2. 6
3. 13
4. 5
5. 14

Day 2 — Fractions, Decimals & Percents

1. 0.375
2. 45%
3. 30
4. 125%
5. 5/12

Day 3 — Solving Linear Equations

1. x = 6
2. x = 5
3. x = 28
4. x = 4
5. x = 4

Day 4 — Ratios, Rates & Proportions

1. 3:4
2. x = 16
3. 50 mph
4. 5 cups
5. x = 6

Day 5 — Mixed Review — Week 1

1. 10
2. 30
3. x = 5
4. 70%
5. x = 10

Day 6 — Percent Change & Percent Error

1. 20%
2. 25%
3. 6%
4. $60
5. 25%

Day 7 — Rounding & Number Sense

1. 3.14
2. 250
3. 0.085
4. 18
5. 6.00

Day 8 — Negative Numbers & Absolute Value (Deviations)

1. 12
2. 8
3. −8
4. 12
5. 0

Day 9 — Exponents, Square Roots & Scientific Notation

1. 25
2. 9
3. 8
4. 3.4×10^6
5. 5

Day 10 — Mixed Review — Week 2

1. 15%
2. 6.4
3. 8
4. 8
5. $36

Day 11 — Categorical vs. Quantitative Data

1. Categorical
2. Quantitative (discrete)
3. Quantitative (continuous)
4. Any variable describing a category, e.g., eye color, gender, or yes/no responses
5. Categorical

Day 12 — Population vs. Sample

1. The entire group of individuals being studied
2. A subset of the population used to collect data
3. 200
4. Sampling is more practical — it saves time, money, and effort
5. Collecting data from every individual in the population

Day 13 — Sampling Methods

1. A sample in which every member of the population has an equal chance of being selected
2. Dividing the population into groups (strata) and randomly sampling from each group
3. Sampling whoever is easiest to reach; it tends to produce a biased, unrepresentative sample
4. Selecting every n-th individual from a list after a random starting point
5. People with strong opinions are more likely to respond, so the sample is not representative

Day 14 — Observational Studies vs. Experiments

1. In an experiment, researchers impose a treatment; in an observational study, they only observe
2. A variable that affects both the explanatory and response variables, making it hard to determine cause and effect
3. To provide a baseline for comparison against the treatment group
4. Confounding variables and bias
5. A fake treatment given so subjects don’t know whether they received the real treatment, reducing placebo-effect bias

Day 15 — Mixed Review — Week 3

1. Quantitative (continuous)
2. Convenience sampling; the sample is not representative of the population
3. A population is the entire group of interest; a sample is a subset of that group
4. To serve as a comparison/baseline for the treatment group
5. Stratified sampling

Day 16 — Frequency Tables & Relative Frequency

1. 3
2. 3/8 = 0.375 (37.5%)
3. Frequency is a count; relative frequency is the proportion (fraction) of the total
4. 0.3 (30%)
5. 1 (or 100%)

Day 17 — Bar Graphs & Pie Charts

1. Categorical
2. The proportion (percentage) of the total represented by that category
3. 50
4. Bar graphs display categorical data with gaps between bars; histograms display quantitative data with no gaps
5. 150

Day 18 — Histograms & Dot Plots

1. The frequency (count) of data values in that interval
2. 20–30
3. Individual data values plotted as dots above a number line
4. 4 data points have a value of 7
5. An interval of values that are grouped together

Day 19 — Stem-and-Leaf Plots & Frequency Distributions

1. Stem = 4, leaf = 7
2. 21, 24, 25
3. It preserves the actual data values while still showing the shape of the distribution
4. The running total of frequencies up to and including that class
5. 10–19

Day 20 — Mixed Review — Weeks 1–4

1. x = 5
2. 27
3. Yes — it is quantitative (numerical)
4. Frequency
5. 20

Day 21 — Mean, Median & Mode

1. 8
2. 9
3. 5
4. 5
5. 25

Day 22 — Range & Variability

1. 26
2. The values are close together (low variability)
3. 4
4. It only uses the two extreme values and ignores all the values in between
5. 13

Day 23 — Variance & Standard Deviation (Concepts)

1. The typical (average) distance of data values from the mean
2. 5
3. −3, −1, 1, 3
4. Set A's data values are more spread out than Set B's
5. No, it is always zero or positive

Day 24 — Effects of Outliers on Center & Spread

1. The mean
2. 22.8
3. 4
4. It decreases
5. The median is resistant to (not affected by) outliers and skewness

Day 25 — Mixed Review — Week 5

1. 15
2. 6
3. 38
4. 8
5. The median

Day 26 — Quartiles & the Five-Number Summary

1. 15.5
2. 8
3. 23
4. Minimum, Q1, median, Q3, maximum
5. Minimum = 3, maximum = 25

Day 27 — Interquartile Range (IQR) & Outliers

1. 12
2. Q1 − 1.5 × IQR
3. Q3 + 1.5 × IQR
4. Yes, since 50 > 30 + 15 = 45
5. −10

Day 28 — Box Plots (Box-and-Whisker Plots)

1. The data outside the quartiles, from the minimum to Q1 and from Q3 to the maximum (excluding outliers)
2. The middle 50% of the data, from Q1 to Q3
3. The median
4. The data is skewed right
5. As individual points or dots beyond the whiskers

Day 29 — Comparing Distributions with Box Plots

1. The centers are similar, but the spreads (variability) differ
2. Box Plot A's data values tend to be lower overall than Box Plot B's
3. The median
4. No, a box plot does not directly show the mean
5. The median is roughly equidistant from Q1 and Q3

Day 30 — Mixed Review — Weeks 5–6

1. 17
2. 11
3. Yes, since $100 > 40 + 30 = 70$
4. The middle 50% of the data (the IQR)
5. 7.5

Day 31 — Describing Distribution Shape

1. The left and right sides of the distribution are mirror images of each other
2. It has a longer tail on the right side, toward higher values
3. It has a longer tail on the left side, toward lower values
4. The mean
5. A distribution with two peaks (modes)

Day 32 — The Normal Distribution & the 68-95-99.7 Rule

1. A symmetric, bell-shaped curve
2. About 68%
3. About 95%
4. About 99.7%
5. They are equal, both at the center of the distribution

Day 33 — Z-Scores

1. How many standard deviations a value is from the mean
2. $z = 2$
3. $z = -1$
4. It is equal to the mean
5. It is 2 standard deviations below the mean

Day 34 — Applying the Normal Distribution

1. 85 and 115
2. 70 and 130
3. 50%
4. About 84%
5. 14

Day 35 — Mixed Review — Week 7

1. Skewed left
2. About 95%
3. $z = 1.5$
4. Less than the mean
5. 66

Day 36 — Reading Scatterplots

1. The relationship between two quantitative variables
2. A positive association
3. A negative association
4. Little to no association between the variables
5. The explanatory (independent) variable

Day 37 — The Correlation Coefficient (r)

1. From -1 to 1
2. A perfect positive linear relationship
3. A perfect negative linear relationship
4. No linear relationship
5. $r = 0.85$

Day 38 — Line of Best Fit (Linear Model)

1. To model the linear relationship between two variables and make predictions
2. 25
3. The change in y for each one-unit increase in x
4. The predicted value of y when $x = 0$
5. 11

Day 39 — Residuals

1. The difference between an observed value and the predicted value (observed minus predicted)
2. 5
3. Whether a linear model is appropriate for the data
4. The observed value is less than the predicted value
5. A curved or systematic pattern, rather than random scatter

Day 40 — Mixed Review — Weeks 7–8

1. About the 16th percentile
2. A strong (negative) relationship
3. 14
4. -5
5. A negative association

Day 41 — Interpreting Regression Output

1. For each additional year of age, predicted height increases by 2 units
2. 70
3. The predicted height at age 0, which may not be meaningful in context
4. About 81% of the variation in the response variable is explained by the explanatory variable
5. Using a model to predict outside the range of the original data; the relationship may not hold there

Day 42 — The Coefficient of Determination (r^2)

1. 0.36
2. $r = 0.7$ or $r = -0.7$
3. The proportion of variation in y explained by the linear relationship with x
4. No, r^2 is always between 0 and 1
5. Yes, it explains a large proportion of the variation

Day 43 — Influential Points & Correlation vs. Causation

1. A point whose removal would significantly change the regression line
2. No — correlation does not imply causation
3. A variable not measured in a study that may be influencing the relationship between the variables studied
4. Ice cream sales and drowning rates (both increase in summer due to warm weather)
5. Outliers can have a large effect on the slope and r, especially in small data sets

Day 44 — Making Predictions with Regression Equations

1. 19
2. 60
3. 80
4. As x increases, y tends to decrease
5. 6 hours

Day 45 — Mixed Review — Week 9

1. 0.64
2. 19
3. It influences the relationship between two studied variables without being accounted for
4. No
5. For each additional hour studied, the predicted test score increases by 2 points

Day 46 — Sample Spaces & Simple Probability

1. 1/6
2. 3/8
3. {HH, HT, TH, TT}
4. 1/2
5. 0

Day 47 — The Complement & Addition Rule

1. 0.7
2. 1/3
3. 0.7
4. 1/2
5. 0.75

Day 48 — Independent & Dependent Events

1. The outcome of one event does not affect the probability of the other
2. 1/4
3. No — sampling without replacement makes the events dependent
4. 1/36
5. 0.2

Day 49 — Conditional Probability

1. The probability of event B occurring, given that event A has occurred
2. 1/2
3. 0.4
4. 0.5
5. P(B)

Day 50 — Mixed Review — Week 10 (Two-Way Tables)

1. 5/8 (0.625)
2. 2/5 (0.4)
3. 1/2
4. 0.3
5. 5/6

Day 51 — Random Variables & Probability Distributions

1. A variable whose value is a numerical outcome of a random process
2. A discrete random variable takes countable values; a continuous one can take any value in an interval
3. Yes — the probabilities are all between 0 and 1 and sum to 1
4. 0.8
5. Each is between 0 and 1, and they sum to 1

Day 52 — Expected Value

1. $2
2. 1.7
3. The long-run average outcome over many repetitions
4. $1.25
5. $3.50

Day 53 — The Law of Large Numbers & Simulation

1. As the number of trials increases, the sample proportion (or mean) gets closer to the true probability (or population mean)
2. No — short-run variation is expected; the law applies to large numbers of trials
3. To model a random process and estimate probabilities through repeated trials
4. 1/6
5. Over many bets, outcomes approach the expected probabilities, which favor the house

Day 54 — Sampling Variability & Sampling Distributions

1. The distribution of a statistic (such as a sample mean) across many samples of the same size
2. The spread decreases (sample means become less variable)
3. The natural variation in a statistic from sample to sample
4. Approximately normal
5. Larger samples have less sampling variability (a smaller standard error)

Day 55 — Mixed Review — Week 11

1. 0.8
2. Long-run outcomes approaching theoretical probabilities as the number of trials increases
3. The distribution of a statistic across repeated samples
4. Discrete
5. 0.2

Day 56 — Comprehensive Review I

1. 8
2. x = 5
3. Categorical
4. 16
5. 20

Day 57 — Comprehensive Review II

1. z = 2
2. A strong negative linear relationship
3. 8
4. 3/4
5. 17

Day 58 — Comprehensive Review III

1. About 68%
2. 21
3. 0.12
4. A population is the entire group of interest; a sample is a subset used to gather data
5. 7

Day 59 — Comprehensive Review IV

1. 0.8
2. Min = 2, Q1 = 4, median = 8, Q3 = 12, max = 14
3. 0.4
4. Q3 + 1.5 × IQR
5. x = 6

Day 60 — Statistics Ready! (Final Comprehensive Review)

1. The data values are close to the mean (little variability)
2. r is close to 1
3. Mean = 8, median = 7, mode = 5
4. An experiment imposes a treatment on subjects; an observational study only observes them
5. 80 and 120