

Percents

- ✓ percent = $\frac{\text{part}}{\text{whole}} \times 100$
- ✓ percent change = $\frac{\text{new} - \text{old}}{\text{old}} \times 100$
- ✓ Translate: **of** → ×, **is** → =, **what** → x
- ✓ Enter a percent as a **decimal**: 50% = 0.5
- ✓ Up $p\%$: $\times(1 + \frac{p}{100})$; down $p\%$: $\times(1 - \frac{p}{100})$:
80 × 1.15 = 92
- ✓ **Working back**: 132 after a 20% rise →
132 ÷ 1.2 = 110, not 132 × 0.8
- ✓ No number given? **Start with 100**

Center and spread

- ✓ Mean = $\frac{\text{sum}}{\text{count}}$, so **sum** = mean × count
- ✓ **Median**: the middle value in order; with an even count, the mean of the two middle values
- ✓ **Mode**: the most frequent value; a tie gives more than one
- ✓ **Frequency table**: count each value as many times as it occurs; find the median by running totals
- ✓ **Range** = largest – smallest; **IQR** = Q3 – Q1 (the middle 50%)
- ✓ **Standard deviation**: how spread out from the mean; never calculated on the SAT
 - Values far from the middle: **large**
 - All values the same: **0**
 - Same shape, shifted: **same** standard deviation, different mean
- ✓ **Box plot**: minimum, Q1, median, Q3, maximum

Probability and tables

- ✓ $P = \frac{\text{desired outcomes}}{\text{total outcomes}}$, from 0 to 1; written as a fraction or decimal unless the question asks for a percent
- ✓ **Start with the denominator**: “a wrestler who chose a dark singlet” means the dark-singlet **total**, not everyone
- ✓ **Without replacement**, multiply as the pool shrinks:
3 red of 6 balls, draw 2: $\frac{3}{6} \times \frac{2}{5} = \frac{1}{5}$
- ✓ Not sure which number goes on top? The **smaller** one: a probability is never above 1

Graphs

- ✓ Read the **title** and the **axes** first, then the shape
- ✓ **Scatterplot**: is the trend linear, quadratic or exponential?
- ✓ **Line of best fit**: gives **predicted** values; the points are the **actual** ones
- ✓ Slope sign: rising left to right is **positive**; the line's value at $x = 0$ is its **y-intercept**
- ✓ **Histogram**: how often each value occurs; count the frequencies when finding a median

Samples and inference

- ✓ A **random** sample can stand for the population it was drawn from — and only that population
- ✓ A survey **estimates**: never conclude an exact percentage for everyone, or for the next sample
- ✓ **Margin of error**: the true value is likely within the estimate ± the margin
- ✓ Avoid answers with exact or sweeping claims: **approximately** is the safe word