

Estimation station and class survey for A Level Maths

A Level Math Revision · A Level Maths (Year 12 and Year 13) · Student sheet

Name _____

Class _____

Date _____

The starter is non-calculator. A calculator with statistics functions is needed.

Starter (5 minutes)

1. Estimate $3.98^2 \times 25.1$ by rounding each number to the nearest whole number.
2. A student estimates that a corridor is 30 m long. It is really 24 m. Find the percentage error.
3. Twelve estimates have $\Sigma x = 96$. Find their mean.

Main activity (35 minutes)

Task A: Estimation station

At each station, write your estimate first, then measure. These are one group's results.

- a. Five estimates of the number of counters in a jar were 150, 210, 180, 260 and 200. Find the mean and the standard deviation (dividing by n).
- b. A corridor is 24 m long to the nearest metre and 2.5 m wide to the nearest 0.1 m. Find the upper bound of its floor area.

Task B: Class survey: correlation and regression

Made-up data from eight students:

Height, h cm	150	155	160	165	170	175	180	185
Hand span, s cm	17	18	18	20	20	21	23	23

- a. Find the product-moment correlation coefficient, r .
- b. Find the equation of the regression line of s on h , and use it to estimate the hand span of a student 168 cm tall.
- c. Test, at the 5% level, whether there is positive correlation between height and hand span. The critical value for a sample of 8 (one-tailed, 5%) is 0.6215.

Task C: Travel times

Made-up data: a class of 25 recorded how long their journey to school takes.

Time, t minutes	Frequency
$0 < t \leq 10$	6
$10 < t \leq 20$	9
$20 < t \leq 30$	7
$30 < t \leq 40$	3

a. Estimate the mean and the standard deviation.

b. Use linear interpolation to estimate the median.

Extension

1. Every hand span in task B was measured 0.5 cm too short. Write down the corrected r and the corrected regression line.