

School-supervised mathematical exploration · supported focus

Supported focus · HL

Supported scope

- Supported HL focus. First assessment 2021; current through 2028.
First-assessment-2029 course is separate.. Remaining guide, assessment and practical requirements retain their recorded holds.
- State model conditions and distinguish fictional data from measurements.

Exploration · 1.1

Reasoning

A student wants to predict queue waiting time at the school canteen. A useful exploration needs a question, data and mathematics the student can explain. This lesson studies assumption : A condition adopted to make a mathematical model possible and whose effect should be evaluated.

Exploration · 2.1

Reasoning

Frame a focused question with measurable variables and a feasible method. Keep a dated record of decisions, sources and mathematical reasoning. Use technology to support analysis, and explain every important output in your own words. State the allowed inputs and units before calculating. An equation should express the relationship, not just record a calculator entry.

Exploration · 3.1

Reasoning

Use the displayed relationship within its stated domain.

$$\hat{t} = 1 + 0.2n, \quad e = t - \hat{t}$$

Exploration · 3.2

Reasoning

Check the result against the starting quantities. Substitute into the original relation, or compare the graph and numerical answer where appropriate.

Exploration · 3.3

Reasoning

A pilot records mean waiting times of 3,5,7 minutes when 10,20,30 people are ahead. A first model is $t=1+0.2n$. At $n=25$ it predicts 6 minutes. An actual wait of 8 gives residual 2; investigate varying service rates rather than hiding the mismatch.

Exploration · 4.1

Reasoning

Do not copy a sample exploration, invent data or manufacture personal engagement. A prediction is not evidence until it is compared with observations. Consent and privacy matter when collecting school data. When a shortcut fails, identify the assumption it breaks. Keep an exact value until the requested final rounding.

Exploration · 4.2

Reasoning

The school-supervised mathematical exploration can be replaced by a timed written mock exam. This claim is false. Explain which definition or assumption it violates.

Exploration · 5.1

Reasoning

The school supervises topic approval, checkpoints, authenticity and assessment. For the current 2021 course use the current school's guide and criteria; the 2029 inquiry criteria belong to a different assessment version. A complete solution gives the mathematical result and explains what it means. Check that it is possible in the stated context.

Exploration · 6.1

Reasoning

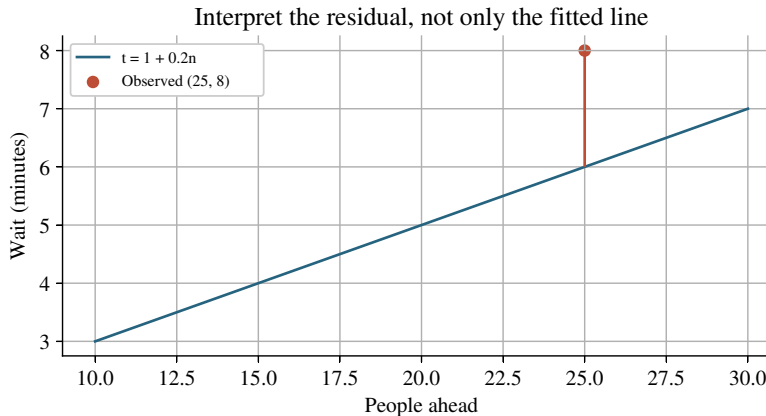
Current first-assessment-2021 Analysis and Approaches HL. This is authored concept support; the full guide is needed to certify every objective. Give the method before the final answer, and use the paper's calculator and formula rules. Review a wrong answer by locating the first invalid step.

Exploration · 6.2

Reasoning

A condition adopted to make a mathematical model possible and whose effect should be evaluated. Choose the relationship, show the method, check its assumptions and interpret the result.

Exploration · diagram



Residual = observed value minus model prediction.

Exploration · original transfer

Your turn

Fictional wait times for $n=10, 20, 30$ are 4, 7, 11 minutes. A proposed model is $t=1+0.3 n$. Find residuals and propose a useful next investigation; do not write a learner's assessed exploration.

Exploration · transfer reasoning

Method and interpretation

Predictions 4, 7, 10; residuals 0, 0, 1 minute. Collect repeated observations across a wider justified range, inspect curvature/variation and compare models. One residual pattern from three invented values does not validate causality or certify an IB exploration.

Check yourself

- Explain assumption using the stated model.
- Change one value in the original transfer; explain which assumption still matters.