**Harold’s Math Etiquette**

**Cheat Sheet**

13 March 2025

**Purpose**

Mathematicians, professors, and strict high school teachers expect students to follow these rules or risk losing points.

**Bad Math Etiquette**

|  |  |  |
| --- | --- | --- |
| **Function** | **Improper Form** | **Proper Form** |
|  | Radicals in the denominator | Radicals in the numerator |
|  | Negative exponents | Positive exponents |
|  | Complex/Imaginary numbers in the denominator | Complex/Imaginary numbers in the numerator  (multiply by the conjugate) |
| **Sets { }** | Unsorted set elements | Sorted set elements |
| **Unsimplified Answers** | Common terms not combined | Common terms combined |
| Common terms not factored | Common terms factored |
| **Ignoring Precision** | Saying “*it’s close enough*” when precision is required. | Follow the exact rules for rounding, significant figures, or proofs. |
| **Unchecked Exceptions** | Assuming a rule always applies without checking exceptions. | Test cases and understand when rules apply. |
| **Misusing Infinity** | Writingwithout understanding that division by zero is undefined. | Use proper limit notation when dealing with infinity. |
| **Academic Dishonesty** | Copying homework or exam answers without learning the material. | Struggle through problems first and seek help if needed. |
| **Improper Attribution** | Plagiarism. | Acknowledging Internet sources, including the use of AI Chatbots. |
| **Take Home Tests** | Open book during a closed-book exam. Unusually high scores often indicate cheating. | Closed book. Be fair to your classmates when taking a makeup exam unattended after being sick. |

**Illegal Math Operations**

|  |  |  |
| --- | --- | --- |
| **Function** | **Undefined** | **Defined** |
| **Algebra** | | |
|  | Division by zero (0)  (vertical asymptote) |  |
|  | Division by zero (0): special case  (hole at ) |  |
|  | Negative square roots |  |
|  | Negative even-powered roots |  |
|  | Negative logarithms or bases  Complex bases |  |
|  | Negative factorials |  |
| **Trigonometry** | | |
|  | Trig functions with division by zero when |  |
|  | Trig functions with division by zero when |  |
|  | Inverse trig functions where |  |
|  | Inverse trig functions where |  |
| **Zero/Infinity** | | |
| Zero (0) |  |  | |
| Infinity (∞) |  |  | |
|  | Modulo by zero |  | |
| **Linear Algebra** | | | |
| Matrix Division |  | If is invertible | |

**Polishing a Math Assignment**

|  |  |  |
| --- | --- | --- |
| **Category** | **Rule** | **Clarification** |
| **1. Accuracy** | **1.1 Double-check calculations** | Rework problems to verify correctness. |
| **1.2 Check the formulas** | Ensure the correct formulas, theorems, or techniques are used. |
| **1.3 Validate units and notation** | If dealing with measurements, ensure correct units are used, properly converted, and shown with answers. |
| **1.4 Check equation balancing** | For algebraic equations, confirm both sides are equal. For chemistry equations, confirm the conservation of both mass and charge on both sides. |
| **1.5 Ensure correct sign usage** | Pay attention to negative (-) signs, exponents, and coefficients. |
| **2. Mistakes** | **2.1 Look for arithmetic mistakes** | Simple errors can impact the entire solution. |
| **2.2 Look for algebraic mistakes** | Incorrect factoring, distributing, or sign errors. |
| **2.3 Verify logical consistency** | Ensure no contradiction in your steps. |
| **3. Logical** | **3.1 Neatly organize steps** | Show logical progression in solving problems. |
| **3.2 One step per line** | Avoid cramming multiple steps into one line. |
| **3.3 Don’t skip steps unless trivial** | Makes it easier for readers to follow. |
| **3.4 Justify steps when necessary** | If a step isn’t obvious, provide a brief explanation. |
| **4. Neatness** | **4.1 Use legible handwriting** | If handwritten, write clearly and consistently. |
| **4.2 Align equal signs** | Keep equations lined up for readability. |
| **4.3** Box or highlight final answers | Make answers stand out for easy grading. |
| **5. Formatting** | **5.1 Use proper symbols** | Ensure symbols (e.g., ∑, ∫, π, ∆, ≠) are correctly used. |
| **5.2 Use consistent font and size** | Stick to a standard, readable format. |
| **5.3 Label graphs and diagrams** | Axes, units, and labels must be included. |
| **5.4 Use margins for notes** | If submitting a physical paper, keep space for comments or corrections. |
| **5.5 Format fractions properly** | Avoid ambiguities like 1/2x vs. (1/2)x. |
| **6. Readability** | **6.1 Avoid cluttered work** | Keep work spaced out for easy reading. |
| **6.2 Don’t jump around** | Show your steps from Left ⟶ Right, Top ⟶ Bottom, or vice versa. |
| **6.3 Maintain proper spacing** | Don’t clutter solutions, leave space between problems. |
| **6.4 Avoid unnecessary abbreviations** | Write abbreviations in full upon first use. |
| **7. Completeness** | **7.1 Answer all parts of the question** | If a problem has multiple parts, don’t leave any out. |
| **7.2 Double-check word problems** | Ensure answers make sense in context. |
| **7.3 Write full sentences for explanations** | If required, provide clear justifications. |
| **8. Justification** | **8.1 Use proper mathematical reasoning** | Avoid skipping essential explanations. |
| **8.2 Include definitions or assumptions** | If necessary, state assumptions made. |
| **9. Spelling & Grammar** | **9.1 Use proper mathematical vocabulary** | Distinguish between terms like "factor" and "multiple." |
| **9.2 Write concise explanations** | Keep answers direct and to the point. |
| **9.3 Check the spelling of technical terms** | Misspellings can confuse the reader. |
| **9.4 Use a spelling and grammar checker** | Most editors include a spell checker. |
| **10. Proofreading** | **10.1 Check for typos** | Ensure numbers, symbols, and variables are correct. |
| **10.2 Ensure proper alignment** | Especially for equations in multi-step solutions. |
| **10.3 Review instructions** | Make sure all questions are fully answered. |
| **11. Professional** | **11.1 Number each question clearly** | Corresponding to the assignment format. |
| **11.2 Use a consistent structure** | Uniformly solve similar types of problems. |
| **11.3 Check for completeness** | Ensure all required problems are included. |

**Sources**

* ChatGPT 4o (12 March 2025), Open AI:
  + “Rules for polishing a math assignment”
  + “more rules for Rules for polishing a math assignment”
  + “what is considered bad math etiquette?”