MHF4U Culminating Performance Task 2026

Product: Group Teams of 3 + individual reflection

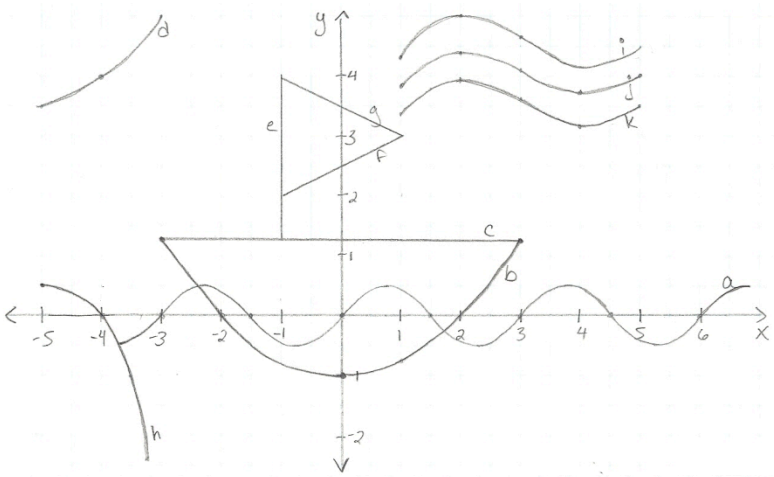
Work periods: Jan.8th and 9th **Due Date:** Friday, January 9th, 2026 END of Class

Students will be in groups arranged by your teacher in groups mostly of 3 people.

Students may use their notes, but no electronic devices on the first day.

Overview

In this task, you will use your understanding of different types of functions and how functions can be combined. Specifically, you will **create an image using the equations of functions**. Note that for each equation, you will need to determine the appropriate transformations and restrictions to the domain and range (see example below).



a: $y = 0.5\sin\left(\frac{2\pi}{3}x\right)$ D: $\{x \mid x \in \mathbb{R}, x \geq -3.7\}$ R: $\{y \mid y \in \mathbb{R}, -0.5 \leq y \leq 0.5\}$

b: $y = \frac{1}{4}x^2 - 1$ D: $\{x \mid x \in \mathbb{R}, -3 \leq x \leq 3\}$ R: $\{y \mid y \in \mathbb{R}, -1 \leq y \leq \frac{5}{4}\}$

c: $y = \frac{5}{4}$ D: $\{x \mid x \in \mathbb{R}, -3 \leq x \leq 3\}$ R: $\{y \mid y \in \mathbb{R}, y = \frac{5}{4}\}$

d: $y = 2^{x+4} + 3$ D: $\{x \mid x \in \mathbb{R}, -5 \leq x \leq -3\}$ R: $\{y \mid y \in \mathbb{R}, 3.5 \leq y \leq 5\}$

e: $x = -1$ D: $\{x \mid x \in \mathbb{R}, x = -1\}$ R: $\{y \mid y \in \mathbb{R}, \frac{5}{4} \leq y \leq 4\}$

f: $y = 0.5x + 2.5$ D: $\{x \mid x \in \mathbb{R}, -1 \leq x \leq 1\}$ R: $\{y \mid y \in \mathbb{R}, 2 \leq y \leq 3\}$

g: $y = -0.5x + 3.5$ D: $\{x \mid x \in \mathbb{R}, -1 \leq x \leq 1\}$ R: $\{y \mid y \in \mathbb{R}, 3 \leq y \leq 4\}$

h: $y = \frac{1}{x+3} + 1$ D: $\{x \mid x \in \mathbb{R}, -5 \leq x \leq -3.3\}$ R: $\{y \mid y \in \mathbb{R}, -\frac{7}{3} \leq y \leq \frac{1}{3}\}$

i: $y = 0.5x + \sin x + 3$ D: $\{x \mid x \in \mathbb{R}, 1 \leq x \leq 5\}$

j: $y = 0.5x + \sin x + 2.5$ D: $\{x \mid x \in \mathbb{R}, 1 \leq x \leq 5\}$

k: $y = 0.5x + \sin x + 2$ D: $\{x \mid x \in \mathbb{R}, 1 \leq x \leq 5\}$

Your completed picture must include:

- At least one (1) function from each unit: polynomial, rational, trigonometric, exponential/logarithmic, and combined (i.e., addition, subtraction, or multiplication of functions)
- At least ten (10) distinct equations in total

Evaluation will be based on:

- number and complexity of functions
- accuracy of equations and restrictions on domain &/or range
- amount of detail/creativity in the picture/image

Group structure

You will work in groups of 3. Your final product is assessed as a group, and you will also submit an individual reflection.

Timeline and tools

Day 1 (paper & pencil only): need grid paper today

- Choose a design that will fit entirely inside the required viewing window.
- Sketch your intended picture on the grid and decide which function type will draw each piece.
- Start writing equations and planned domain restrictions for each piece (labels A, B, C, ...).

Day 2 (Desmos):

- Build your picture in Desmos using your plan and submit it on Google Classroom (one per group).
- Submit the individual reflection assignment on Google Classroom.

Graph window requirements

Your final Desmos view must use the following window:

- x from – 10 to 10
- y from – 10 to 10

The grid does not need to be visible (you can turn axes and gridlines off); however, the picture must be readable without zooming in or out.

What to submit

1. Your final **Desmos graph** showing the full window x in [– 10, 10], y in [– 10, 10].
2. An **individual reflection** (submitted separately by each group member), answering the following:
   a) What was your most significant contribution toward the final product? Give specific evidence (what you created, fixed, or justified).
   b) Which piece was the most challenging to restrict, and why? Explain how you chose its domain restriction.
   c) Describe one mistake your group made while building the image and how you fixed it.

🚨 Academic integrity

You may collaborate with your group members only. The final equations, restrictions, and justifications must be your group's own work. Do not copy from other individuals/groups or the internet.
This is an open-book (notes-only). No electronics on Day 1
All graphing, calculation, and final writing must be completed during the allocated class time.

Prohibited Tools: The use of any Generative AI to generate equations, functions, analysis, or the like is strictly forbidden. Any submission found to contain unpermitted AI-generated work will result in a mark of zero (0) and potential disciplinary action.

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Team Members (Full) Names: _____

Rubric

Total: 100%. Group product: 80%. Individual reflection: 20%.

Group product (80%)

Criteria (weight)	Level 1	Level 2	Level 3	Level 4
Mathematical accuracy of equations and restrictions (30%)	Many equations/restrictions are incorrect or do not match the graph. Key pieces are missing or inconsistent.	Some correct equations, but multiple errors or mismatches between table and graph. Restrictions are sometimes unclear.	Most equations and restrictions are correct and match the graph. Minor errors do not significantly affect the image.	Equations and restrictions are consistently correct and match the graph. Endpoints and open/closed details are handled correctly.
Domain, range, (20%)	Domain/range are missing or mostly incorrect. Little/no intention for endpoints/intersections.	Some domain/range correct, but several are incorrect/inconsistent or not the restricted piece. Domain and range seem to be done with some intention.	Domain/range are mostly correct for restricted pieces. Domain and range are done with intention.	Domain/range are clearly done with intention.
Variety and appropriate challenge (15%)	Does not meet several required function-type requirements or relies heavily on near-duplicate simple pieces.	Meets most requirements but limited variety/challenge; restrictions are mostly chosen rather than justified.	Meets all requirements with a good variety.	Meets all requirements and includes advanced features.
Communication and organization (15%)	Graph/table are difficult to follow: labels are missing, unreadable, or inconsistent.	Some organization, but readability or consistency problems make it harder to interpret.	Clear and organized: labels match, graph is readable.	Highly clear and polished: consistent notation, clean graph, and professional presentation.

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Team Members (Full) Names: _____

Your Name: _____ (This is only the rubric for your teacher to mark. The individual reflection is done and submitted online in your google classroom form titled Task Reflection)

Individual reflection (20%)

Criteria (weight)	Level 1	Level 2	Level 3	Level 4
Mathematical reflection and evidence (15%)	Very limited explanation; little/no math evidence; vague statements.	Some explanation, but weak specificity or limited math evidence.	Clear explanations with appropriate math evidence (at least one worked example).	Insightful, specific explanations with strong math evidence; clearly connects choices to the final image.
Contribution to group work (5%)	Contribution is unclear or unsupported.	Some contributions are described but lack evidence or specificity.	Clear description of contribution with specific evidence.	Strong, specific contribution with clear evidence of impact on the final product.