SPEEDING TICKETS

New York state wants to change its system for assigning speeding fines to drivers. The current system allows a judge to assign a fine that is within the ranges shown in Table 1.

Table 1. New York Speeding Fines

Miles per Hour over Speed Limit	Minimum Fine	Maximum Fine
1 – 10	$45	$150
11 – 30	$90	$300
31 or more	$180	$600

Some people have complained that the New York speeding fine system is not fair. The New Drivers Association (NDA) is recommending a new speeding fine system. The NDA is studying the Massachusetts system because of claims that it is fairer than the New York system.

Table 2. Massachusetts Speeding Fines

Miles per Hour over Speed Limit	Fine
1 – 10	$100 flat charge
11 or more	$100 flat charge plus $10 for each additional mph above the first 10 mph

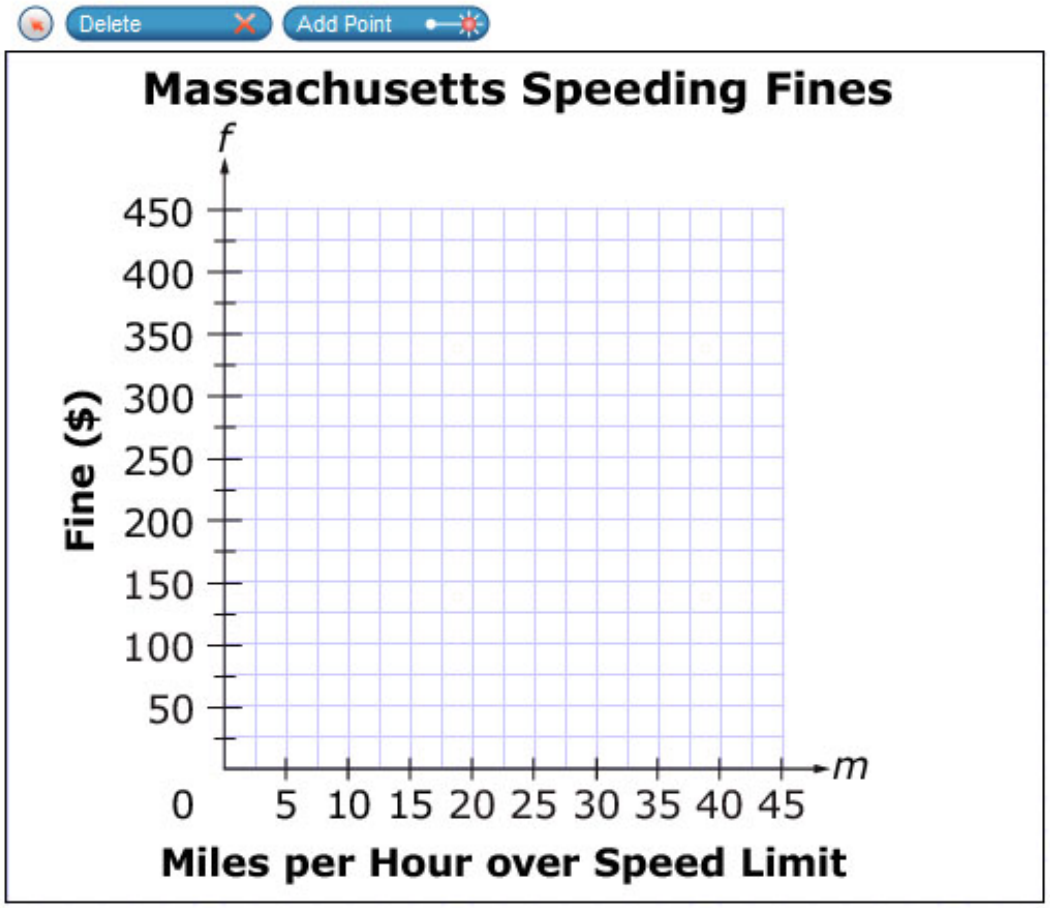
In this task, you will:

- analyze the speeding fine systems for both New York and Massachusetts.
- use data to propose a fairer speeding fine system for New York state.

1. ***Part A***

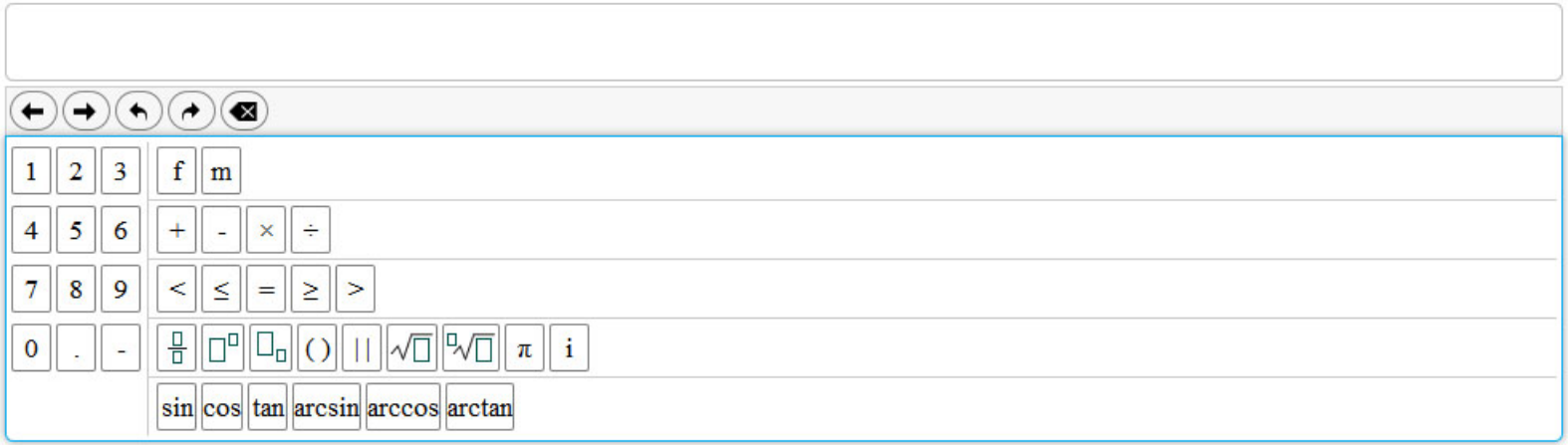
Use the information in Table 2 to plot data points for Massachusetts speeding fines.

- Plot a point to represent the fine for driving 5 mph over the speed limit.
- Plot additional points for each increment of 5 mph over the speed limit up to 45 mph over the speed limit.



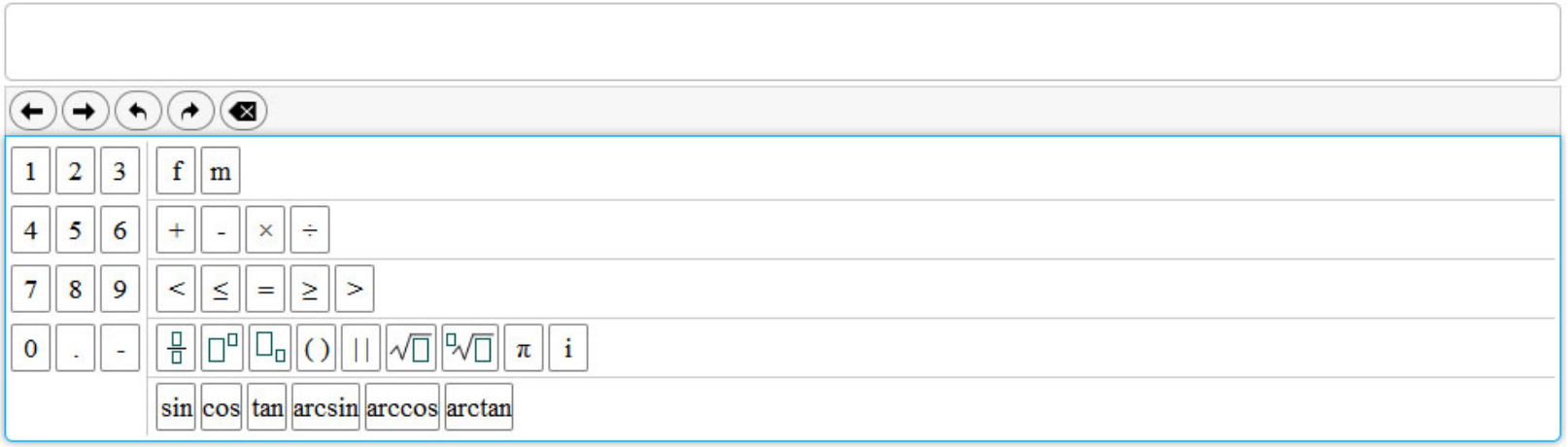
2. ***Part B***

Create an equation to calculate the Massachusetts speeding fine, f, based on the number of miles per hour, m, over the speed limit when $1 \leq m \leq 10$.



3. ***Part C***

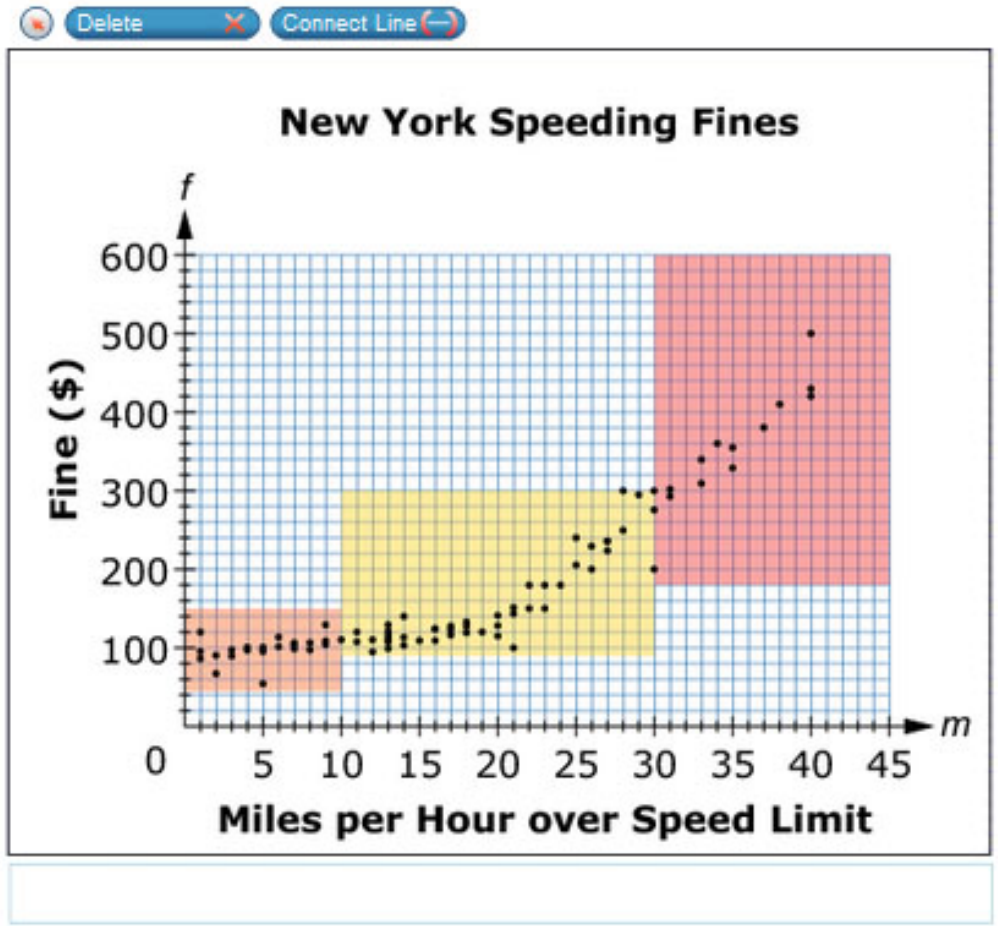
Create an equation to calculate the Massachusetts speeding fine, f, based on the number of miles per hour, m, over the speed limit when $m > 10$.



4. The graph below shows data from a sample of actual fines for driving above the speed limit in New York.

Part A

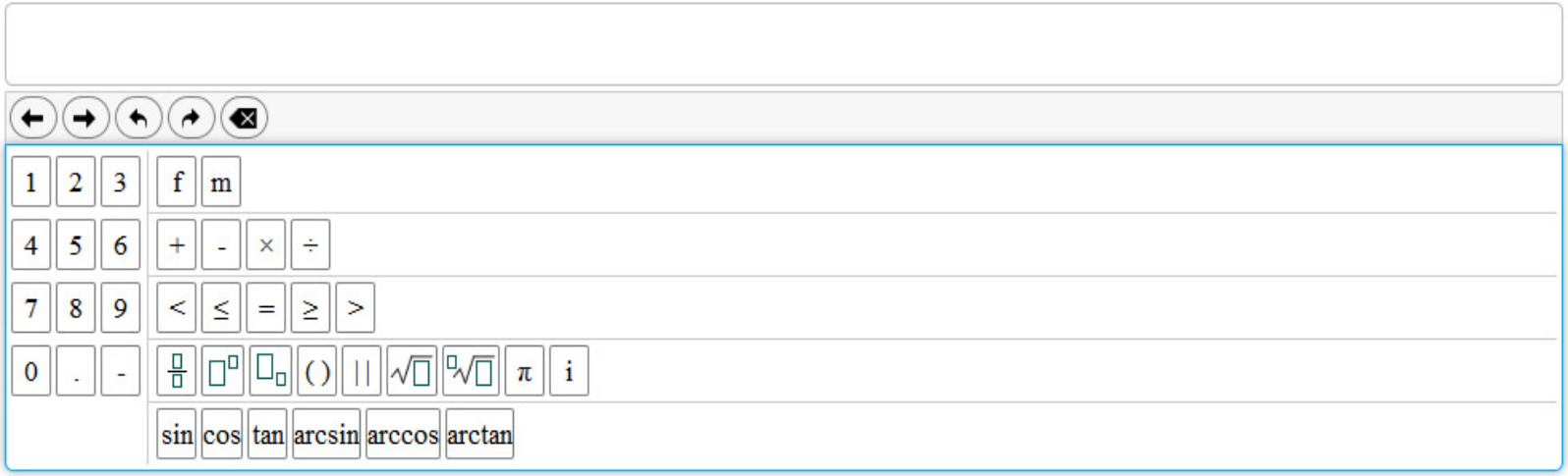
Use the Connect Line tool to create a piecewise linear model with two line segments, one for $1 \leq m \leq 20$ and one for $20 \leq m \leq 40$, that approximates the best fit for the data.



5. ***Part B***

Using your model from part A, create an equation to calculate the speeding fine, f, based on the number of miles per hour, m, over the speed limit when $1 \leq m \leq 20$.

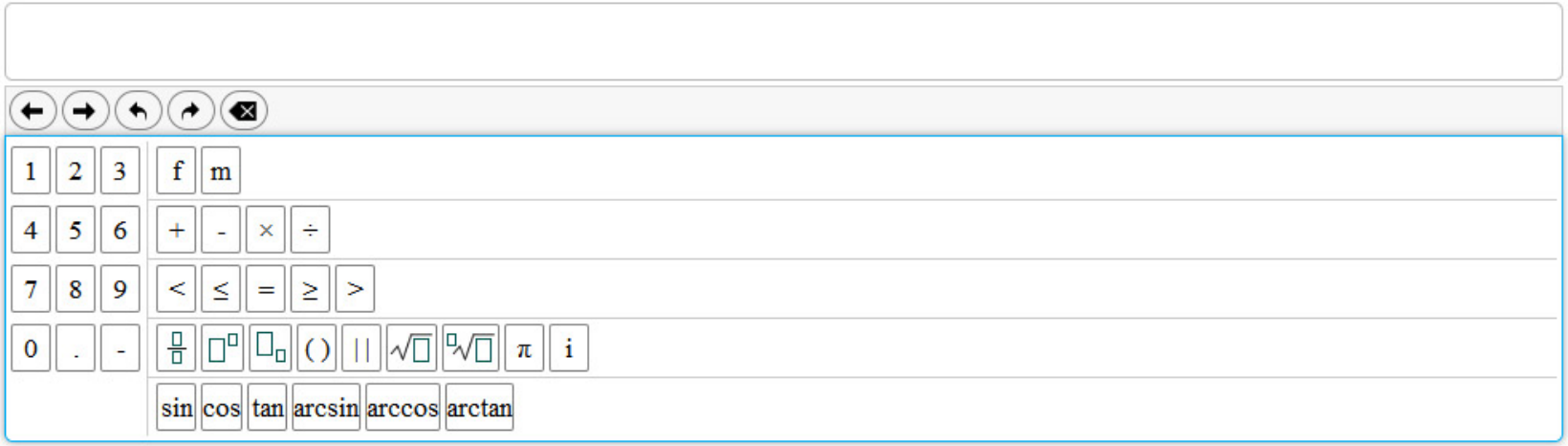
This equation will be the start of the proposed new model for the New York speeding fine system.



6. ***Part C***

Using your model from part A, create an equation to calculate the speeding fine, f, based on the number of miles per hour, m, over the speed limit when $m > 20$.

This equation will complete the proposed new model for the New York speeding fine system.



7. The NDA claims that the proposed new model for the New York speeding fine system is fairer than the current system.

Do you agree or disagree with the claim? Explain your reasoning using specific examples from this task.