

Modelling with Trigonometric Functions

Given data in some form (e.g., graph, table of values, descriptive text), it is possible to model the data as an equation.

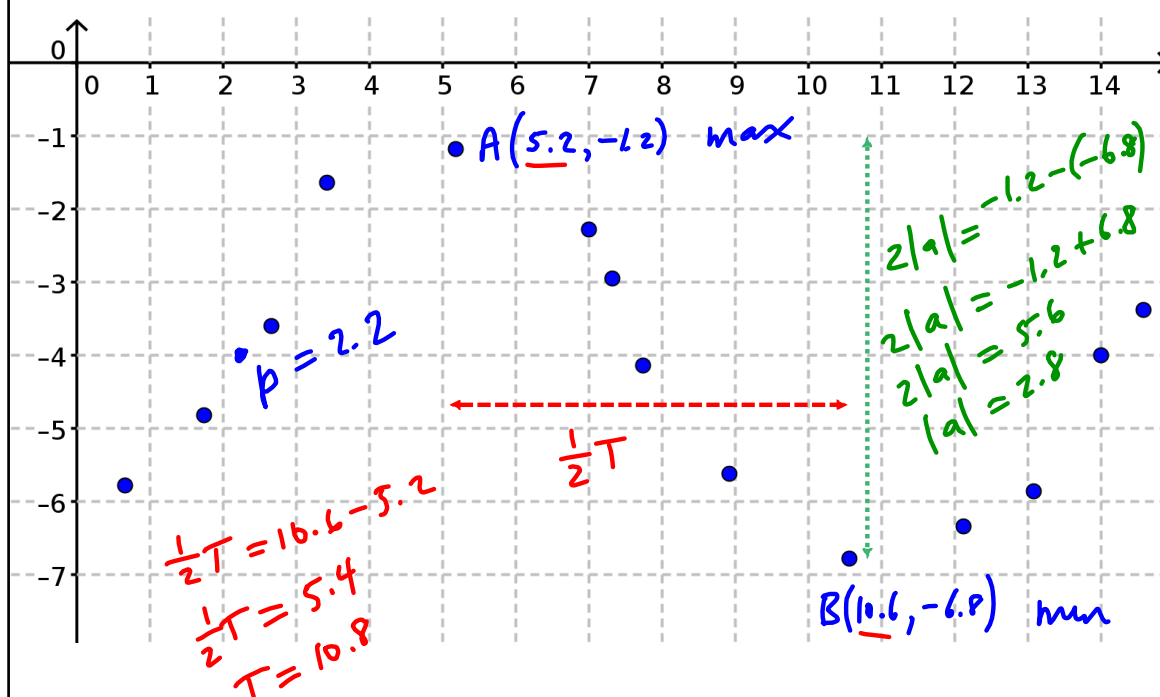
Such models are usually approximations of the actual situation, but they are much simpler to work with than the original data.

They may also have limited applicability, which we express through restrictions on the domain (e.g., an equation may only be valid for the first 24 hours).

When answering questions related to the data, it is often useful to use a combination of the mathematical model (equation) as well as the graphical representation, as each has advantages and disadvantages.

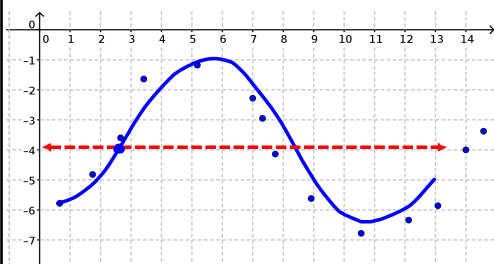
Nov 3-9:27 AM

Ex.1 Determine an algebraic model for the following data.



Nov 1-6:58 PM

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$$|a| = \frac{\text{max} - \text{min}}{2}$$

$$\begin{aligned} q &= \frac{\text{max} + \text{min}}{2} \\ &= \frac{-1.2 + (-6.8)}{2} \\ &= \frac{-8.0}{2} \\ &= -4.0 \end{aligned}$$

$= -4.0$ (Axis of the curve)

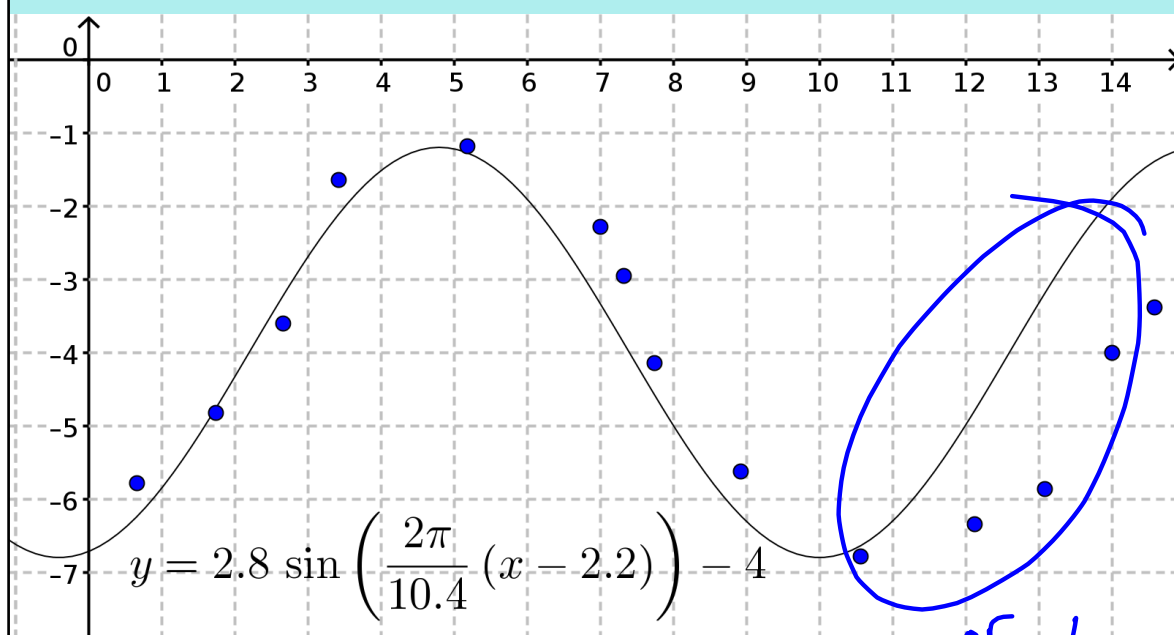
$$\begin{aligned} T &= 10.8 \\ |a| &= 2.8 \\ T &= \frac{2\pi}{k} \\ k &= \frac{2\pi}{T} \\ &= \frac{2\pi}{10.8} \end{aligned}$$

$$\begin{aligned} p &= 2.2 \\ a &= 2.8 \end{aligned}$$

$$y = 2.8 \sin \left[\frac{2\pi}{10.8} (x - 2.2) \right] - 4$$

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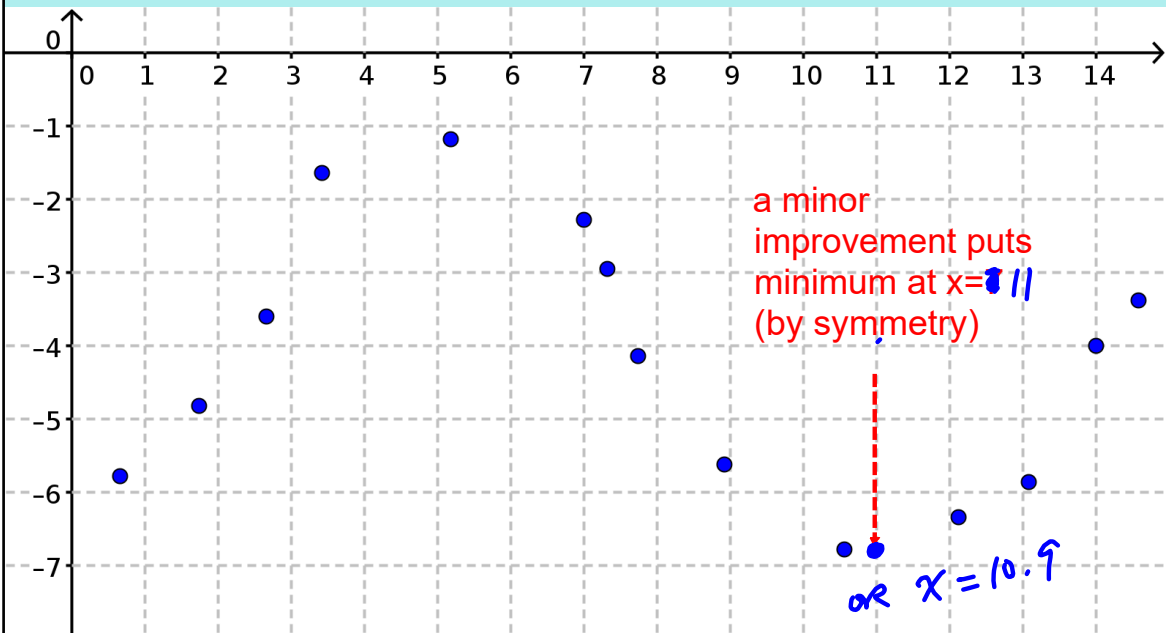
Ex.1 Determine an algebraic model for the following data.



poor match!

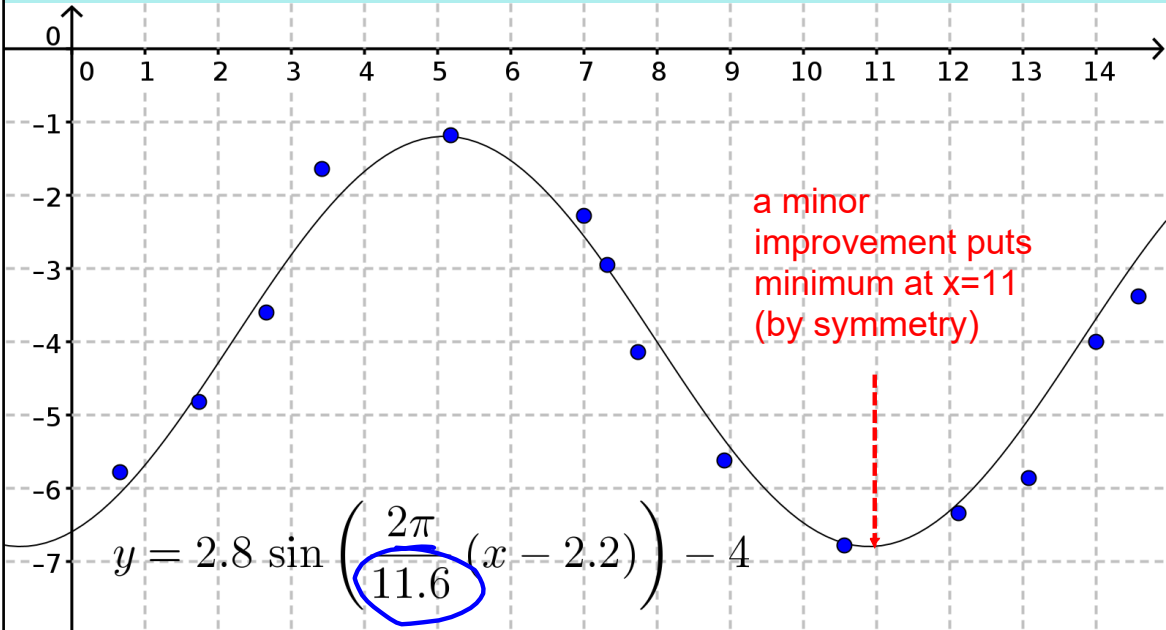
Nov 1-6:58 PM

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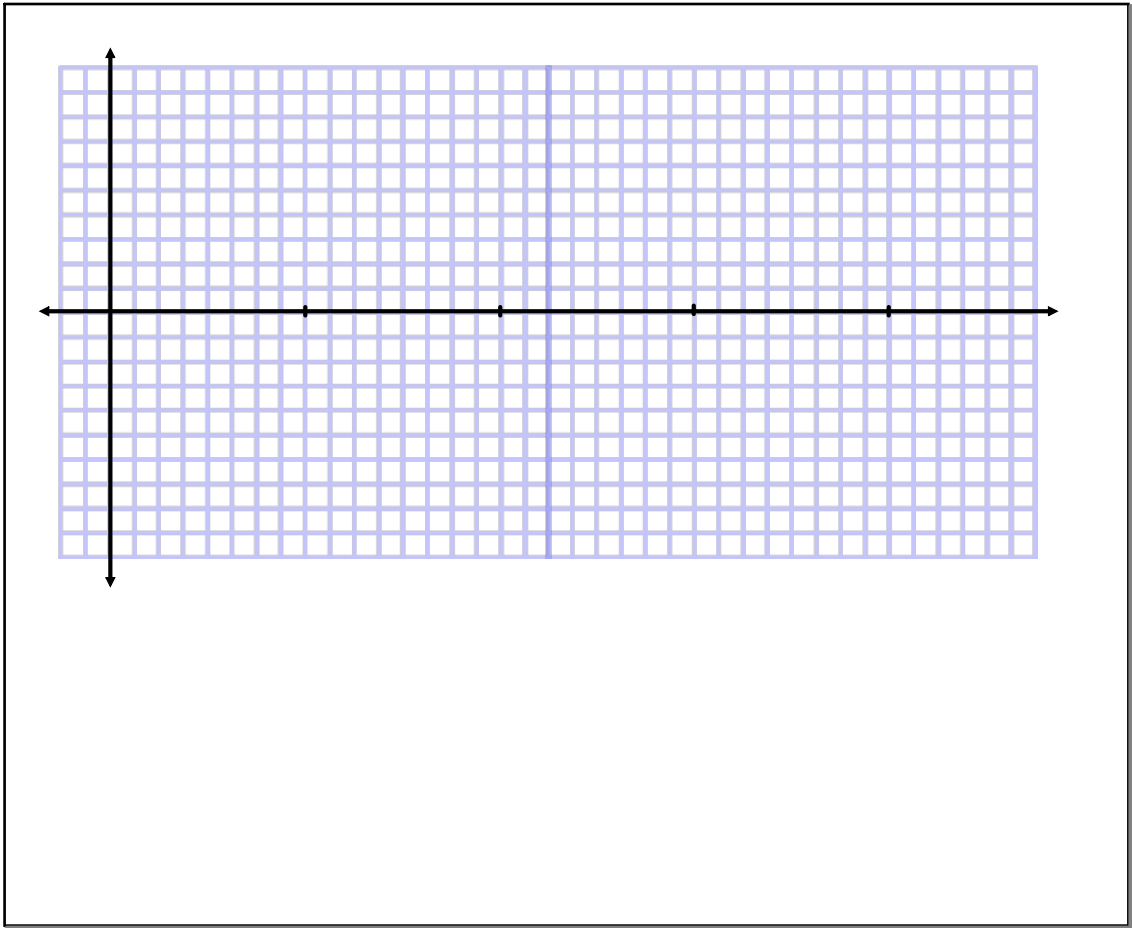


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Assigned Work:

p.360 # 1-3, 5, 6, 7, 9, 11

May 22-8:28 AM



Oct 31-10:13 AM