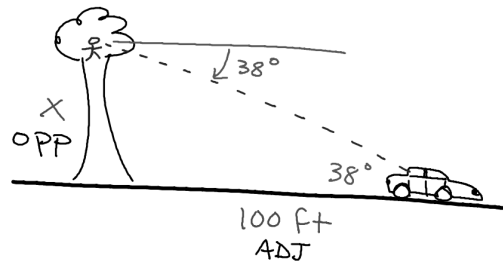


A tree trimmer is up in a tree and sees his truck with an angle of depression of 38° . If his truck is parked 100 feet from the tree, how high up in the tree is he? Round to the nearest tenth.



$$\tan 38^\circ = \frac{X}{100}$$

$$X = 78.1 \text{ ft}$$

What does it mean if something is Periodic?



Definition of PERIODIC

- 1 a
:
occurring or recurring at regular intervals
- b
:
occurring repeatedly from time to time

- 2 a
:
consisting of or containing a series of repeated stages, processes, or digits
:
CYCLIC • *periodic* decimals • a *periodic* vibration

- b
:
being a function any value of which recurs at regular intervals

Section 13-1: Periodic Functions

What you should be able to do after this section:

- Tell if a function is periodic or not.
- Identify a cycle
- Find the following of periodic functions:
 - Period
 - Amplitude
 - Equation of the Midline(Axis)

Periodic function: A repeating pattern of y-values at regular intervals.

Cycle: One complete pattern.

The smallest portion of the function that could be translated left and right to create the entire function.

Period: The width of one cycle (x-values)

Amplitude:

The vertical distance from the midline to either the maximum or the minimum. y-values

OR

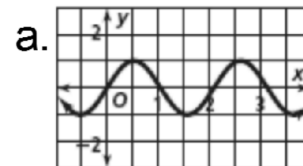
Half the total height of the periodic function

Midline (also called the Axis):

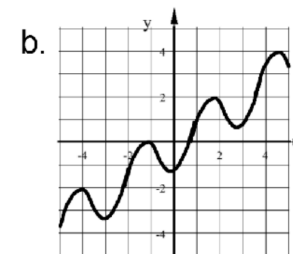
The horizontal line that passes through the middle of the graph.

→ $y = \#$

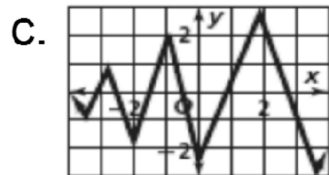
1. Is each of the below a periodic function? If no, explain why.



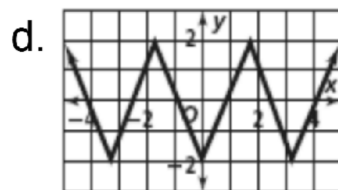
yes



NO, y-values increase, they don't repeat



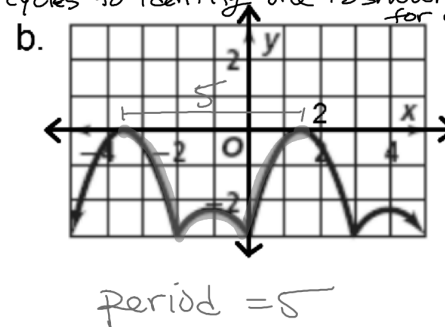
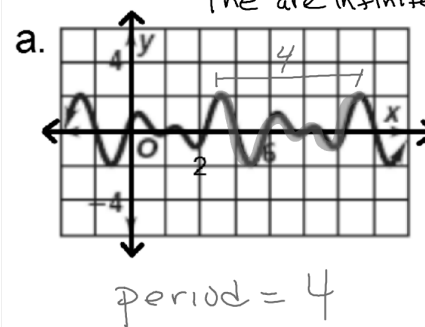
No,
the same y-values
don't repeat



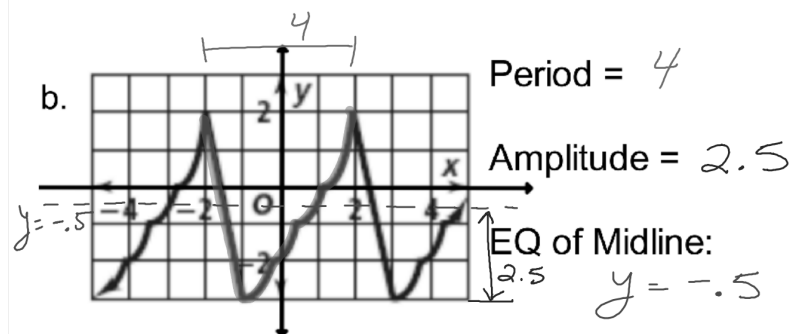
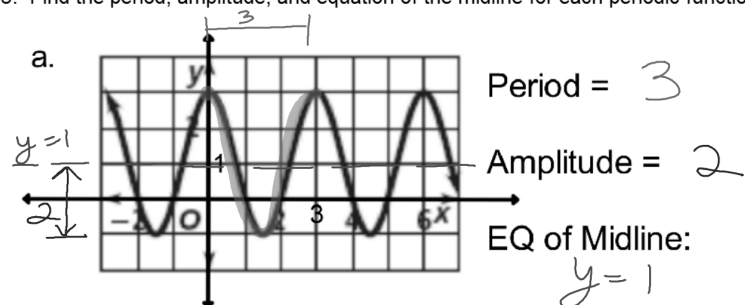
Yes

2. Highlight one cycle of each periodic function and find its period.

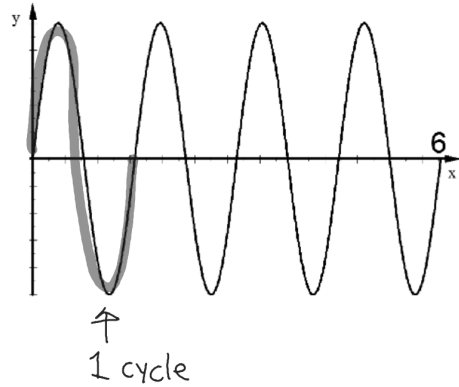
The are infinite cycles to identify one is shown for each



3. Find the period, amplitude, and equation of the midline for each periodic function.



4. Find the period of this periodic function.



$$\frac{6 \text{ units}}{4 \text{ cycles}}$$

period = 1.5 units/cycle

If you can't tell by looking at the graph, this is how you find the Midline and Amplitude mathematically.

Midline (Axis): $y = \frac{Max + Min}{2}$

Amplitude = $\frac{Max - Min}{2}$ = half the total height