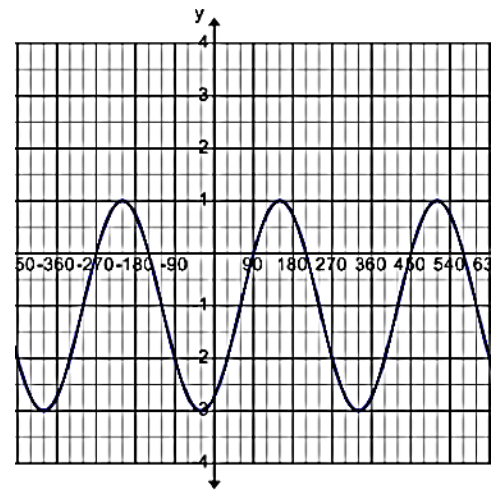


## U6D7 MCR 3UI Warm Up:

- a) Write two equations of a sinusoidal function (one sine and one cosine) that has amplitude 3, period  $90^\circ$  and a maximum at  $(0, 5)$ .
- b) Determine a sine and a cosine equation for the graph to the right.



## Trigonometric Applications

When given sinusoidal word problems, it often helps to graph what you know. You may also need to use the formulas below to help determine the values needed to create the equation (if one is not provided for you).

$$y = asink(x - d) + c$$

**Amplitude ( $|a|$ ) =**

**k =**

or

**Period =**

**Equation of Sinusoidal Axis:**

**Maximum =**

**Minimum =**

**Example 1:** The height of a chair on a Ferris wheel in motion can be modelled with a sinusoidal function. The diameter of the wheel is 22m and the passengers board from a platform 1 m above the ground. The ride lasts 3 minutes and the wheel makes 6 complete revolutions.

- a) Graph the function.
- b) Determine the equation of the relation.

Fill in the information you know...

Amplitude:

Period:

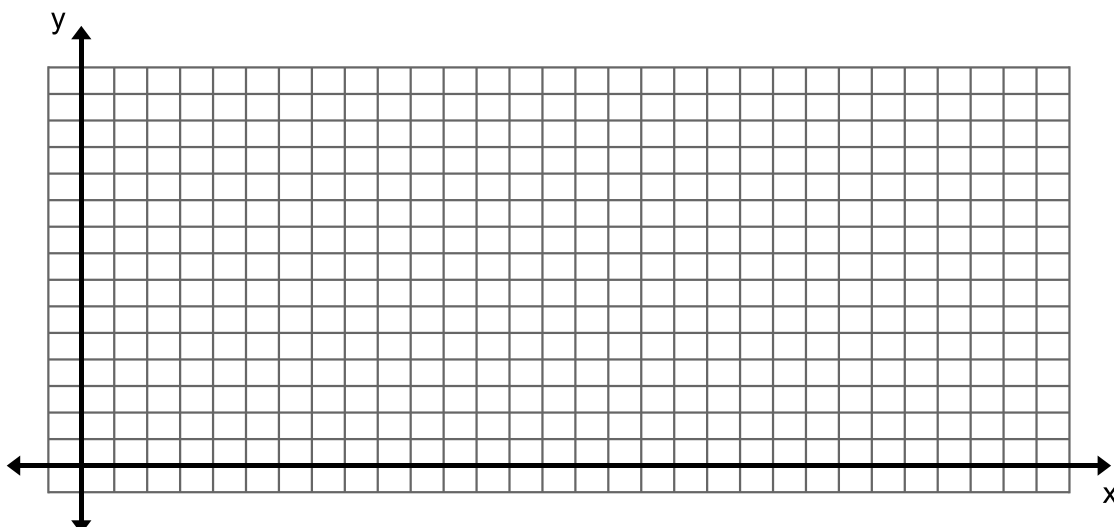
Minimum:

Maximum:

Sinusoidal Axis:

Phase Shift:

Starts at:



**Example 2:** At Hopewell Rocks in New Brunswick, the high and low tide depths are recorded over a period of time. A model of the form of  $D(t) = 20 \sin[30(t - 6)] + 22$  represents the depth of water versus time on a particular day, where  $d(t)$  is the depth of water in feet and  $t$  is the time in hours after midnight.

Fill in the information you know...

Amplitude:

Period:

Sinusoidal Axis:

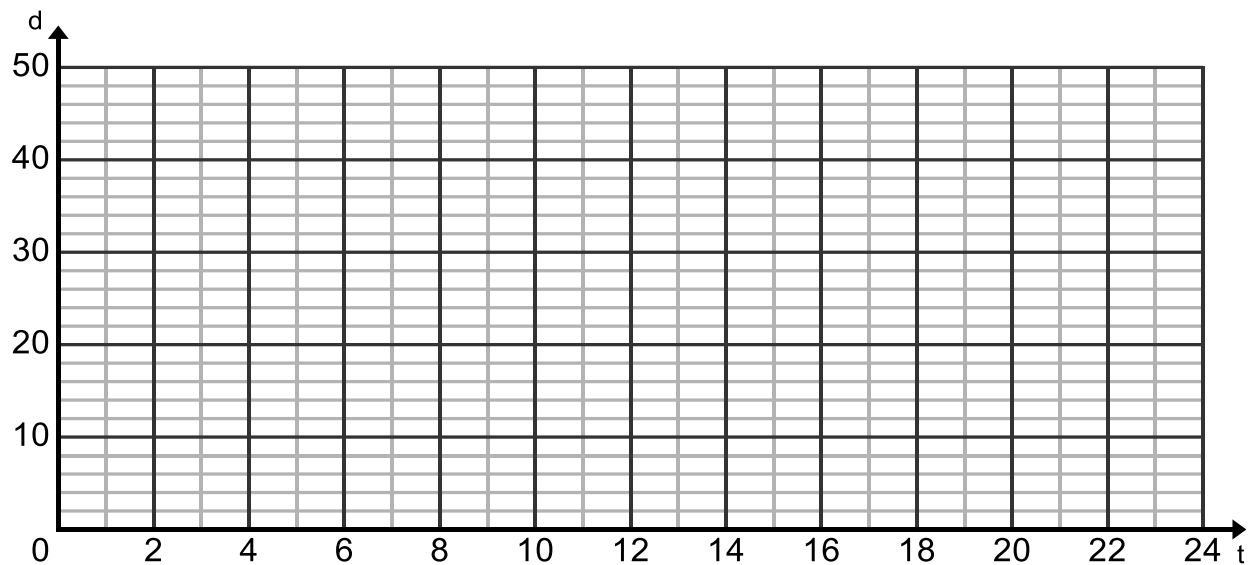
Minimum:

Maximum:

Phase Shift:

Starts at:

Graph the function.



a) Determine the exact depth at 7:00am.

b) It is considered safe to explore the ocean floor and rock formations during low tide as long as the water depth (at the point where it is measured) is less than 6 feet. Using your graph, estimate during what time interval (during daylight) would it be safe to walk the ocean floor at Hopewell Rocks?