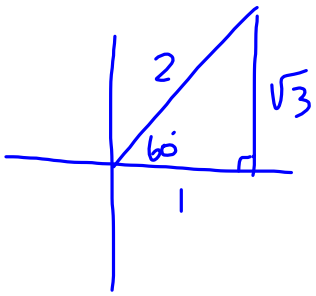
Exact

$\cot 60^\circ$

$= \frac{1}{\tan 60^\circ}$

$= \frac{1}{\left(\frac{\sqrt{3}}{1}\right)} = \frac{1}{\sqrt{3}}$



$\tan\theta = \frac{opp}{adj}$ $\cot\theta = \frac{adj}{opp}$

Dec 9-11:02 AM

Sec 6.6
Word problems with trig

Dec 6-9:12 AM

Use our transformation rules to determine the equation:

$y = a\cos(k(x-d)+c$ or $y = a\sin(k(x-d))+c$

a= the amplitude ⇦ $a = \frac{\max - \min}{2}$

$\frac{2\pi}{k}$ = period ⇦ $k = \frac{2\pi}{period}$

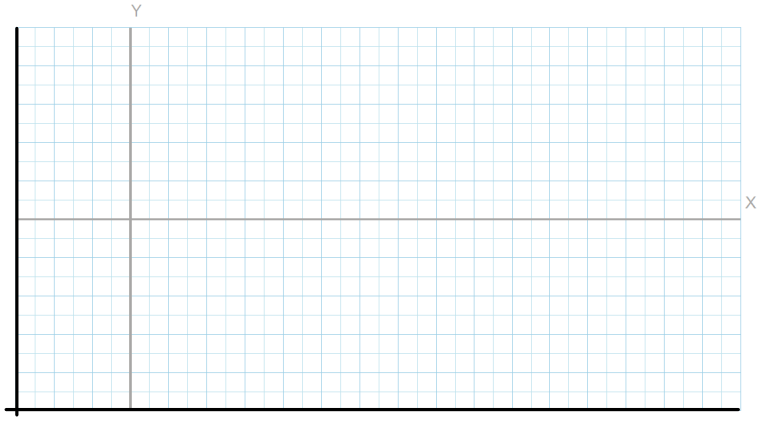
d=horizontal translation (phase shift) ⇦ d = the x-value that relates to the original (0,0)

c= vertical translation ⇦ $c = \frac{\max + \min}{2}$

Once we have the formula we can solve problems.

Nov 24-10:49 AM

A group of students is tracking a friend, John, who is riding a Ferris wheel. They know that John loaded the ferris wheel at t=0 at a height of 1m. They know it took him 90 sec to do one complete revolution, and he had a maximum height of 41m off the ground.



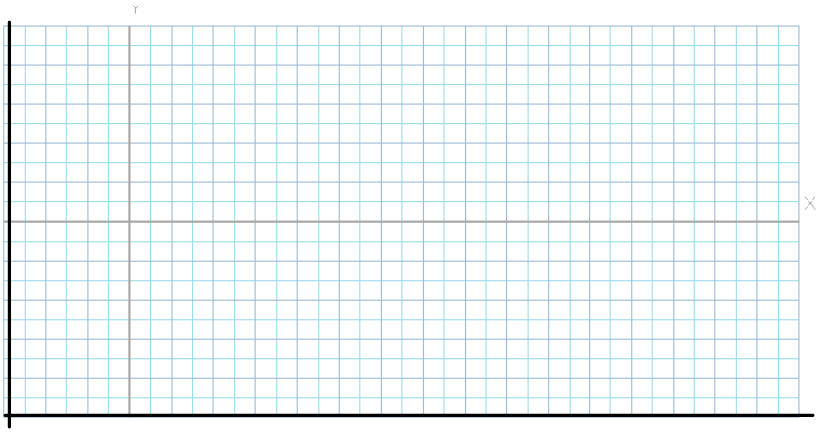
What is the equation that models this situation?

How high off the ground is John (i) 40 sec into the ride? (ii) 100 sec into the ride?

When does John have a height of 30m off the ground?

Dec 8-8:19 PM

Data was collected for the rising and falling tides on the ocean. High tide was 6m above the ocean floor and occurred at 8am. 10hrs later at low tide, the height above the ocean floor was 2m. Graph 2 complete cycles of the tide, starting at high tide (8am).



What is the equation that models the tidal height?

What is the depth of the water at 3pm on the first day?

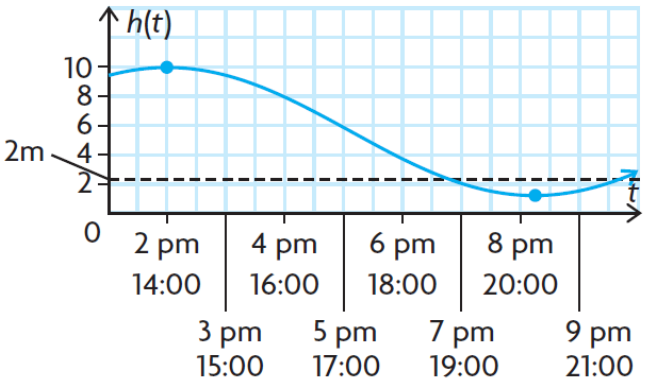
What is the water level at 8am on the second day?

For how many hours is the water level below 3m on the first day?

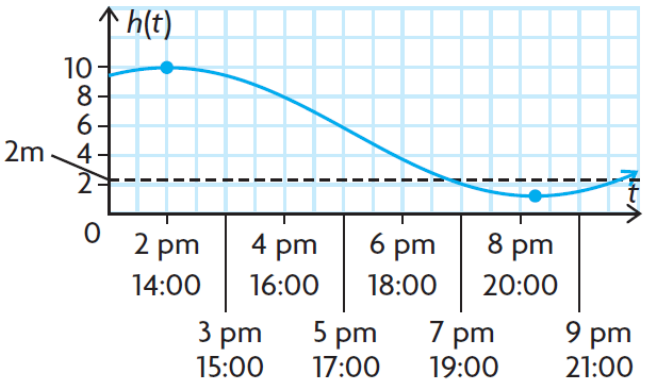
Dec 2-9:16 AM

The tides at Cape Capstan, New Brunswick, change the depth of the water in the harbour. On one day in October, the tides have a high point of approximately 10 m at 2 p.m. and a low point of approximately 1.2 m at 8:15 p.m. A particular sailboat has a *draft* of 2 m. This means it can only move in water that is at least 2 m deep. The captain of the sailboat plans to exit the harbour at 6:30 p.m.

Can the boat sail out of the harbour?



Nov 24-9:55 AM



Max =

Min =

Period=

$a=$ $d=$

$k=$ $c=$

Equation? (use cos as it is easier to find phase shift for cos for this graph)

Nov 23-1:09 PM

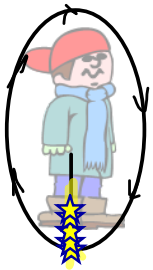
Read through Ex 2 on p356

Notice:
-the data is graphed and then a smooth curve of best fit is applied
-use the curve to find max, min, period
-use the appropriate equations to find a,k,d, and c.
-the sin equation is used this time as it more closely resembles a sin curve.

Nov 24-12:24 PM

Homework
p360 #1,5,6,9,13

Hints:
#1. Some of the calculations are done (ie you have amp already) so just sub in
#5. No "numbers" in this, just an explanation of the meaning of the values.



Sparkler is spinning like this! Perpendicular to the ground.

#6. Use the max and min temp to find "a" and "c". Notice the period is from top to bottom and BACK. The phase shift is always most complicated. Be careful!

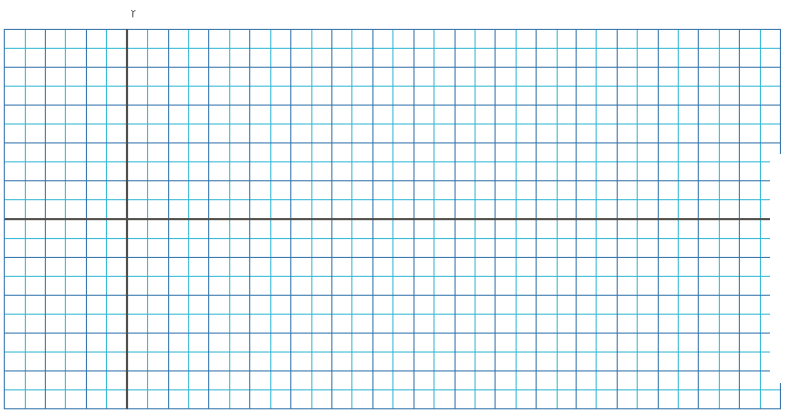
Nov 24-10:41 AM

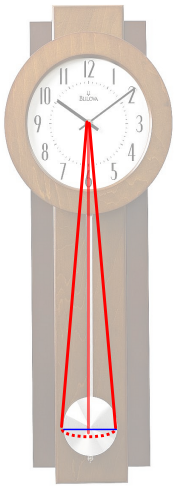
An old clock has a pendulum that swings back and forth, completing one cycle every two seconds.

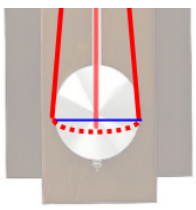
The length of the pendulum is 80cm and at its maximum angular displacement (from the left extreme to the center line) is 12 degrees.

Create an equation that models the horizontal displacement and time.

Graph 2 cycles on the grid below.







Dec 9-9:03 AM