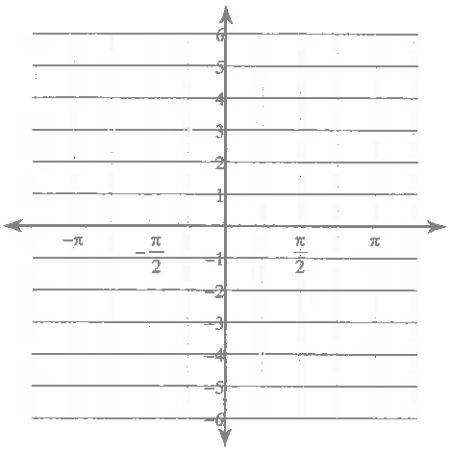
MATH 5 SN Name_____

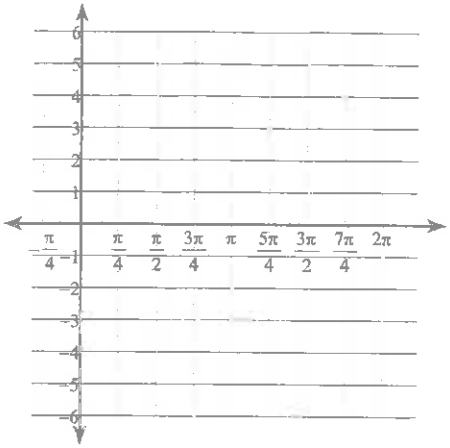
PRETEST - TRIGONOMETRIC FUNCTIONS

Find the amplitude, the period in radians, the phase shift in radians, the vertical shift, the minimum and maximum values, two vertical asymptotes (if any), and the transformations required to obtain the graph starting with a basic trig function. Then sketch the graph using radians.

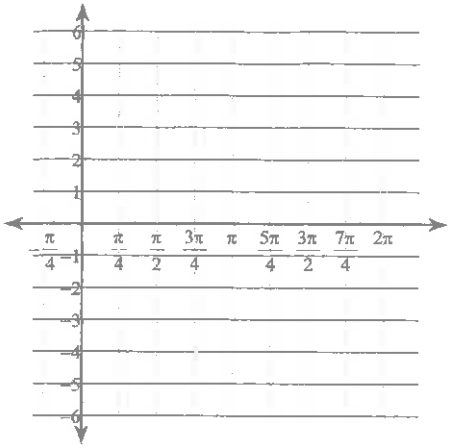
1) $y = 4\sin\left(4\theta - \frac{2\pi}{3}\right) - 1$



2) $y = 2\cos\left(3\theta - \frac{3\pi}{2}\right) + 1$



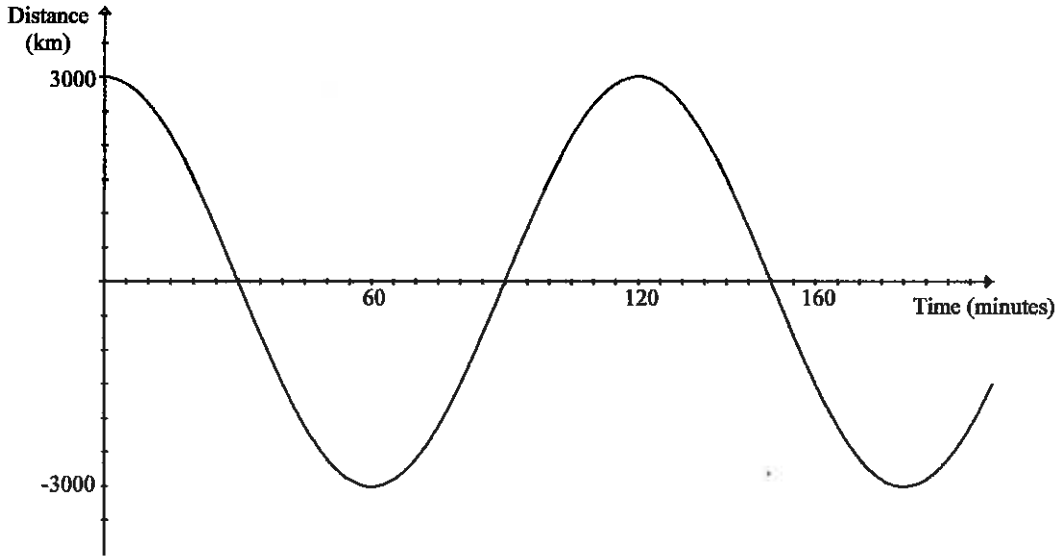
3) $y = \tan\left(\theta - \frac{7\pi}{6}\right) + 1$



4.

~~19~~

A satellite that is launched into orbit from a point 3000 km north of the equator travels alternately north and south of the equator. This distance from the equator, as a function of time, resembles a cosine function, as shown in the diagram. The satellite travels 3000 km south of the equator before returning to a point 3000 km north of the equator in 120 minutes.



How many kilometres north or south of the equator is the satellite after it has been in orbit for exactly 500 minutes?

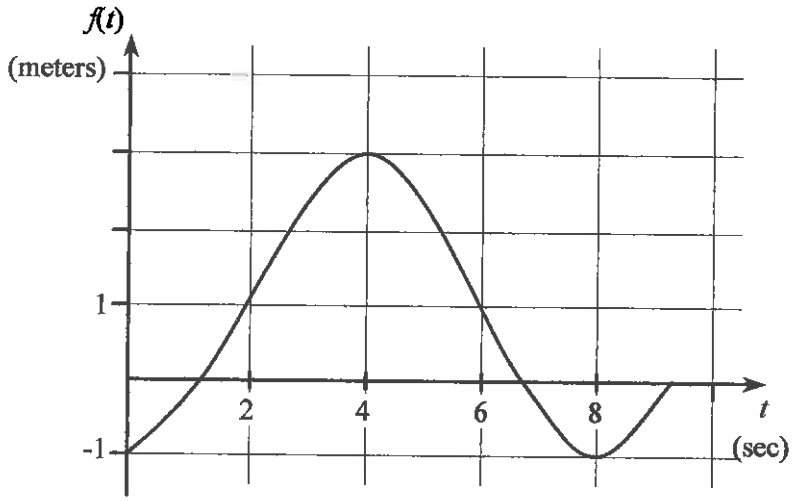
4	3	2	1	0

Show all your work.

Answer: The satellite is _____ km _____ of the equator.

~~20~~ 5

The waves of an artificial lake are being observed in a laboratory. The graph below represents the motion of one of these waves where t is the time in seconds and $f(t)$ is the height of the wave in meters.



~~To the nearest hundredth of a metre,~~ What is the height of the wave after 3 seconds? (Exact Answer)

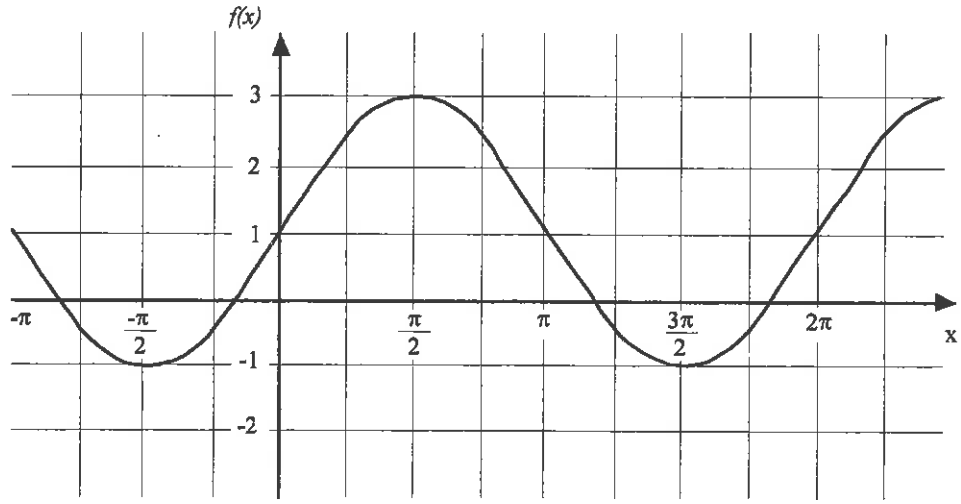
4	3	2	1	0

Show all your work.

Answer To the nearest hundredth of a metre, the height of the wave is _____ m after 3 seconds.

6

~~135~~ Jan is doing research on the phenomena of vibrations. She compiles a series of results and obtains the following graph on the computer screen.



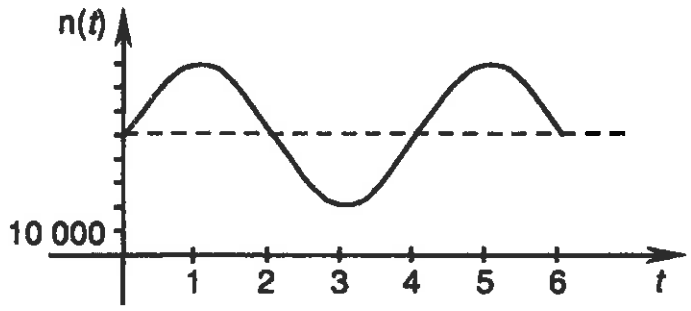
a) What rule represents this function?

b) Between $[0, 6\pi]$, at what x values is $f(x) = 2$?

The rule representing this function is $f(x) =$ _____.

7

~~134~~ The number of pairs of shoes manufactured by a factory from December to June is associated with the sinusoidal function illustrated below.



where t is the number of months elapsed since December and n(t), the number of pairs of shoes.

a) What is the rule of function n?

b) When does the factory manufacture 8 000 shoes?

The rule that corresponds to function n is _____