Today's Learning Goal(s):

Date: _____

By the end of the class, I will be able to:

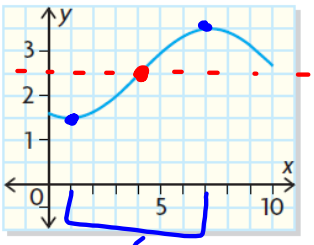
a) recognize the characteristics of arithmetic sequences.
b) write the general term.

Last day's work: pp. 404-405 #1 – 3, 6, 8 – 10, 12, 13

12ab
13f

12. Determine the sine function $y = a \sin k(\theta - d) + c$ for each graph.

a)



3.5
1.5
y=2.5
6

$c = \frac{3.5+1.5}{2}$ $a = \frac{3.5-1.5}{2}$

$= 2.5$ $= \frac{2}{2}$

$= 1$

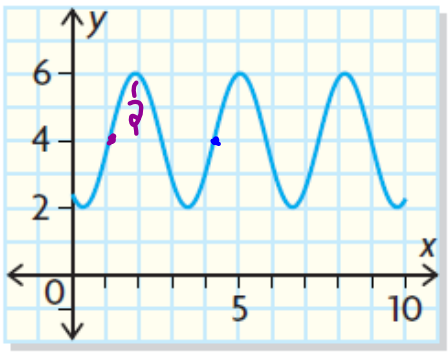
$y = 1 \sin(30(x-4)) + 2.5$

-1 $(x+2)$

$k = \frac{360}{12}$

$= 30$

b)

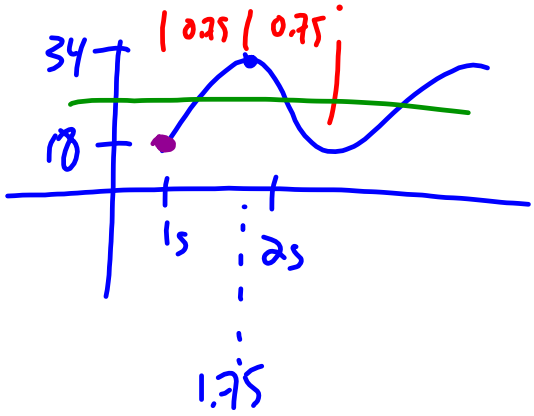


$a = 2$ EqA: $y = 4$ $\therefore c = 4$

X

13. Meagan is sitting in a rocking chair. The distance, $d(t)$, between the wall and the rear of the chair varies sinusoidally with time t. At $t = 1$ s, the chair is closest to the wall and $d(1) = 18$ cm. At $t = 1.75$ s, the chair is farthest from the wall and $d(1.75) = 34$ cm.

a) What is the period of the function, and what does it represent in this situation?
b) How far is the chair from the wall when no one is rocking in it?
c) If Meagan rocks back and forth 40 times only, what is the domain of the function?
d) What is the range of the function in part (c)?
e) What is the amplitude of the function, and what does it represent in this situation?
f) What is the equation of the sinusoidal function?
g) What is the distance between the wall and the chair at $t = 8$ s?



a) period = 1.5 sec

b) $c = \frac{34+18}{2} = 26$ cm

e) $a = \frac{34-18}{2} = \frac{16}{2} = 8$

$k = \frac{360}{1.5}$

$y = -8\cos(240(x-1)) + 26$

7.1 Arithmetic Sequences

Date: Dec. 14/15

Sequence: An ordered set of numbers separated by commas .
Each individual number is called a TERM.
The terms are $t_1, t_2, t_3, t_4, \ldots, t_n$ (*the … is called an ellipsis*)

Arithmetic Sequence:
A sequence that has a common difference between the terms.
(ie. you add or subtract something to get from one term to the next).

Ex.1 Consider the following sequence: 5, 8, 11, 14, 17, ... *often only 3 terms given*

In an arithmetic sequence, the first term is a and the common difference is d
the terms are $a, a+d, a+2d, a+3d, \ldots$

The general term is $t_n = a + (n-1)d$

a) What is the 20th term?

$t_{20} = a + (20-1)d$
$= a + 19d$
$= (5) + 19(3)$
$= 5 + 57$
$= 62$

b) Which term is 341?

$a = 5 \quad d = 3 \quad t_n = 341$

$t_n = 5 + (n-1)(3)$
$= 5 + 3n - 3$
$= 3n + 2$

$t_n = 3n + 2$ and $t_n = 341$
$341 = 3n + 2$
$341 - 2 = 3n$
$339 = 3n$
$113 = n$

∴ 341 is the 113th term

341 is the 113th term

Ex.2 State the first five terms for the following recursive formulas.

a) $t_1 = 8,\ t_n = 6 + t_{n-1}$, n N, n > 1

$t_2 = 6 + t_{2-1}$
$= 6 + t_1$
$= 6 + 8$
$= 14$

$t_3 = 6 + t_2$
$= 6 + 14$
$= 20$

$t_4 = 6 + t_3$
$= 6 + 20$
$= 26$

$t_5 = 6 + t_4$
$= 6 + 26$
$= 32$

8, 14, 20, 26, 32

8, 14, 20, 26, 32

This an arithmetic sequence.

b) $t_1 = 5,\ t_n = 2t_{n-1} + n$, n N, n > 1

$t_2 = 2t_1 + 2$
$= 2(5) + 2$
$= 12$

$t_3 = 2t_2 + 3$
$= 2(12) + 3$
$= 27$

$t_4 = 2t_3 + 4$
$= 2(27) + 4$
$= 58$

$t_5 = 2t_4 + 5$
$= 2(58) + 5$
$= 121$

5, 12, 27, 58, 121

This **NOT** an arithmetic sequence.

Ex.3 The sixth term of an arithmetic sequence is 9, and the 20th term is 44. Find the 101st term.

$t_n = a + (n-1)d$

$t_6 = 9$
$t_6 = a + 5d$
$9 = a + 5d$
$9 = a + 5\left(\frac{5}{2}\right)$
$9 = a + \frac{25}{2}$
$\frac{18}{2} - \frac{25}{2} = a$
$-\frac{7}{2} = a$

$t_{20} = 44$
$t_{20} = a + 19d$
$44 = a + 19d$
$-9 = -a - 5d$
$35 = 14d$
$\frac{35}{14} = d$
$\frac{5}{2} = d$

$a = \frac{-7}{2}, d = \frac{5}{2}, t_{101} = 246.5$

$t_{101} = a + 100d$
$= -\frac{7}{2} + 100\left(\frac{5}{2}\right)$
$= -\frac{7}{2} + \frac{500}{2}$
$= \frac{493}{2}$
$= 246.5$

Are there any Homework Questions you would like to see on the board?

Last day's work: pp. 404-405 #1 – 3, 6, 8 – 10, 12, 13

Today's Homework Practice includes:
pp. 424-425 #1 – 13, 15, 16

Study for the Unit 6 Summative!!