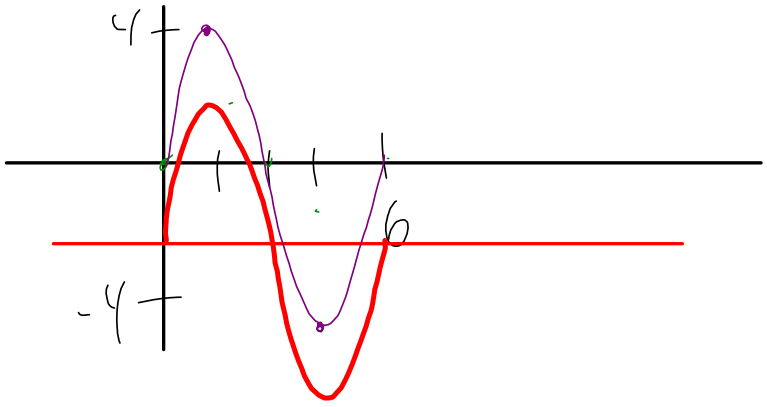
Ch. 6 Review work: pp. 404-405 #1 – 3, 6, 8 – 10, 12, 13

Study for the Unit 6 Summative!!

p. 404 Lesson 6.2

3. Sketch the graph of a sinusoidal function that has a period of 6, an amplitude of 4, and whose equation of the axis is $y = -2$.



p. 404

6. A ship is docked in port and rises and falls with the waves. The function $d(t) = 2\sin(30t)^\circ + 5$ models the depth of the propeller, $d(t)$, in metres at t seconds. Graph the function using a graphing calculator, and answer the following questions.

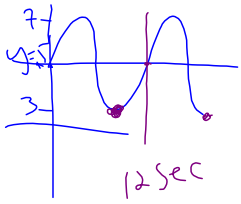
a) What is the period of the function, and what does it represent in this situation?

b) If there were no waves, what would be the depth of the propeller?

c) What is the depth of the propeller at $t = 5.5$ s?

d) What is the range of the function?

e) Within the first 10 s, at what times is the propeller at a depth of 3 m?



→ $y = 5$

a) period $= \frac{360}{|k|}$ $\left\{ k = \frac{360^\circ}{\text{period}} \right.$

$= \frac{360^\circ}{30}$

$= 12$ sec

∴ the time to rise + fall each time

c) $t = 5.5$

$d(5.5) = 2\sin(30(5.5)) + 5$

$= 2\sin(165) + 5$

$\doteq 5.517$

$\doteq 5.52$

d) $R: \{d \in \mathbb{R} \mid 3 \le d \le 7\}$

e) $d(t) = 2\sin(30t)^\circ + 5$ $\left\{ 0 \le t \le 10 \right.$

$3 = 2\sin(30t) + 5$ $\left\{ d = 3 \right.$

$3 - 5 = 2\sin(30t)$

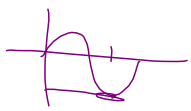
$-2 = 2\sin 30t$

$\frac{-2}{2} = \sin 30t$

$-1 = \sin 30t$

let $w = 30t$

$\sin w = -1$



∴ $w = 270$

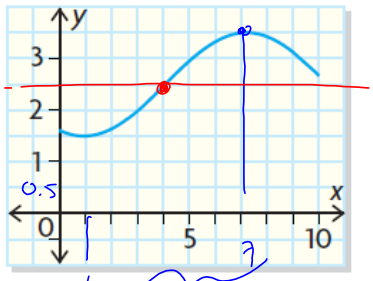
∴ $270 = 30t$

$t = 9$

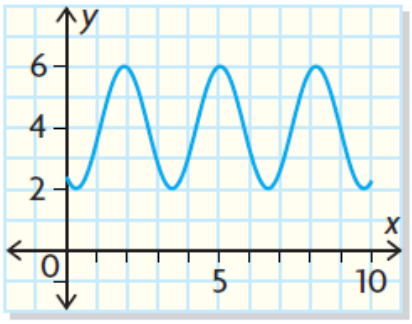
p. 405

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

a)



b)



$a = \frac{\max - \min}{2}$

$= \frac{3.5 - 1.5}{2}$

$= \frac{2}{2}$

$= 1$

$c = \frac{\max + \min}{2}$

$= \frac{3.5 + 1.5}{2}$

$= \frac{5}{2}$

$= 2.5$

$\frac{1}{2}$ cycle $= 6$

$\therefore$ whole period $= 12$

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

$= 30$

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