

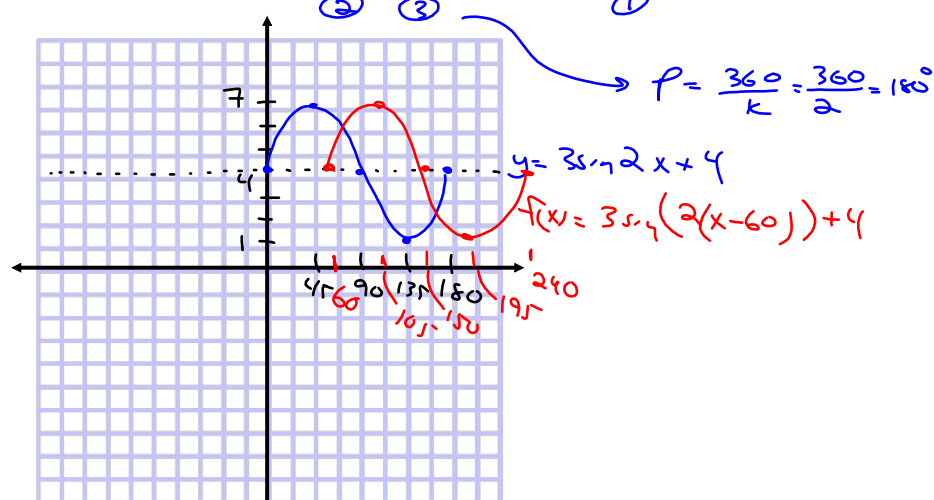
6.5 Sinusoidal Functions

May 14

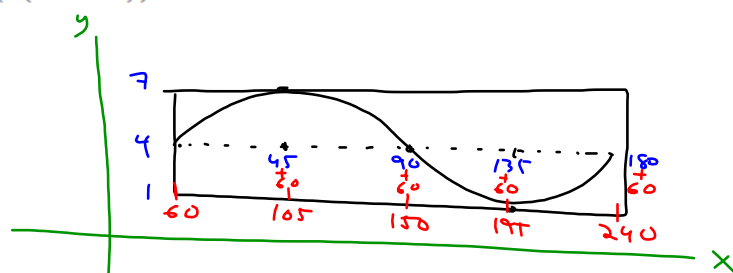
$$y = a \sin(k(x-b)) + c$$

	Transformations	Wave terminology
a	VERTICAL STRETCH $a < 0 \rightarrow$ REFLECT IN X-AXIS	AMPLITUDE
k	HORIZONTAL STRETCH BY $\frac{1}{k}$ $k < 0 \rightarrow$ REFLECT IN Y-AXIS	PERIOD = $\frac{360}{k}$
b	HORIZONTAL TRANSLATION $b > 0 \rightarrow$ RIGHT $b < 0 \rightarrow$ LEFT	PHASE SHIFT
c	VERTICAL TRANSLATION	AXIS $y = c$

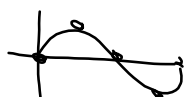
Sketch the graph of $f(x) = 3 \sin(2(x - 60^\circ)) + 4$. DO LAST



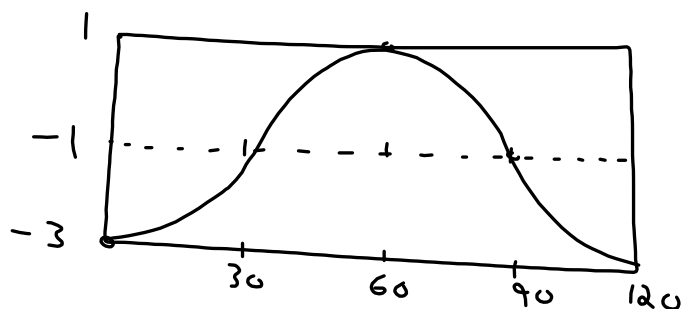
$$3 \sin(2(x - 60^\circ)) + 4$$



$$\begin{aligned} (x, y) &\rightarrow \left(\frac{x}{2} + 60, 3y + 4\right) \\ (0, 0) &\rightarrow (60, 4) \\ (90, 1) &\rightarrow (105, 7) \\ (180, 0) &\rightarrow (150, 4) \\ (270, -1) &\rightarrow (195, 1) \\ (360, 0) &\rightarrow (240, 4) \end{aligned}$$



- a) Graph $y = -2 \cos(3x) - 1$ using transformations.
 b) State the amplitude, period, equation of the axis, **phase shift**, and range of this sinusoidal function.



$$P = \frac{360}{k} = \frac{360}{3} = 120^\circ$$

$$\text{Amplitude} = 2$$

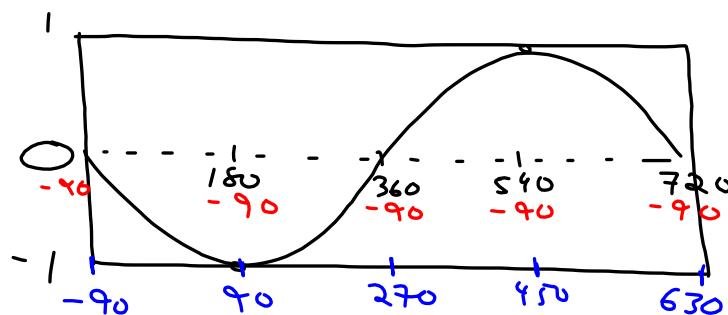
$$\text{Period} = 120^\circ$$

$$\text{Axis } y = -1$$

$$\text{Phase Shift } 0^\circ$$

$$R = \{y \in \mathbb{R} / -3 \leq y \leq 1\}$$

Graph $y = -\sin(0.5x + 45^\circ)$ using transformations.
 $0.5(x + 90^\circ)$



$$P = \frac{360}{.5} = 720^\circ$$

p. 384#4-7,9,10