

Unit 6 lesson 5 Pg 387 #1abceh, 2abdeg, 3ad, 5ab, 6ab Pg ① 6 ②  
 lessons. { Pg 387 #1abceh, 2abdeg, 3ab, 5abcd, 6ab, 7bcd, 8d, 9,  
 11b, 12ad, 14, 16.

1. Recall: a horizontal translation is called

a phase shift

function vertical translation

$$a) y = \sin x + 3$$

$$b) y = \sin x - 1$$

$$c) y = \sin(x - 45^\circ)$$

$$d) y = \sin(x - 60^\circ) + 1$$

$$e) y = \sin(x - 15^\circ) - 4.5$$



45° right

60° right

15° right

2. function vertical translation

$$a) y = \cos x + 6$$

$$b) y = \cos x - 3$$

$$d) y = \cos(x + 72^\circ)$$

$$e) y = \cos(x - 30^\circ) - 2$$



up 6

down 3



left 72°

right 30°

left 110°

$$f) y = \cos(x + 110^\circ) + 2.5$$

$$3. a) y = 3\sin x + 2 \text{ (one cycle)}$$

$$\text{amplitude } 3 \quad \text{period } 360^\circ$$

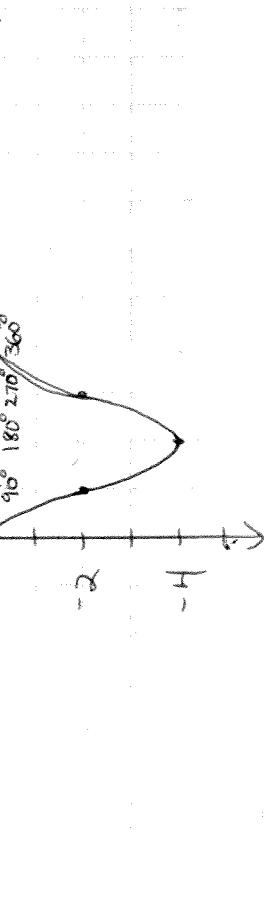
$$D = \{0^\circ \leq x \leq 360^\circ\} \quad R = \{-4 \leq y \leq 0\}$$

$$D = \{ -1 \leq y \leq 5 \}$$

$$R = \{ -3\pi/2 \leq x \leq 3\pi/2 \}$$



one cycle.  
one cycle.  
one cycle.  
one cycle.



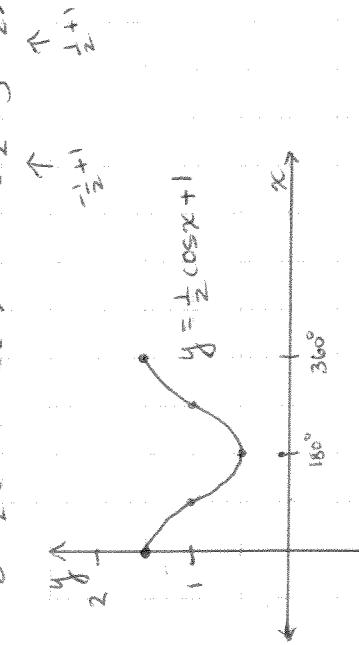
## Unit 6 Lessons 5

Pg 387 #3d) ②

Pg 387 #3d)

$$3d) \quad y = \frac{1}{2} \cos x + 1 \quad (\text{one cycle})$$

$$\text{amplitude } \frac{1}{2} \quad \text{period } 360^\circ \\ D = \{0^\circ \leq x \leq 360^\circ\} \quad R = \left\{ \frac{1}{2} \leq y \leq \frac{3}{2} \right\}$$



Pg 387 #5bc, 6ab  
function

5b)  $y = 0.5 \sin(2x) - 1$

c)  $y = 6 \sin 3(x - 20^\circ)$

a)  $y = 2 \sin \pi x - 3$

6a)  $y = \cos \pi x + 3$

b)  $y = \cos 3(x - 90^\circ)$

Phase Shift

Vert. Trans.

down 1

Period

$$\frac{360^\circ}{2} = 180^\circ$$

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

$$360^\circ$$

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

right  $20^\circ$

down 3

up 3

right  $90^\circ$